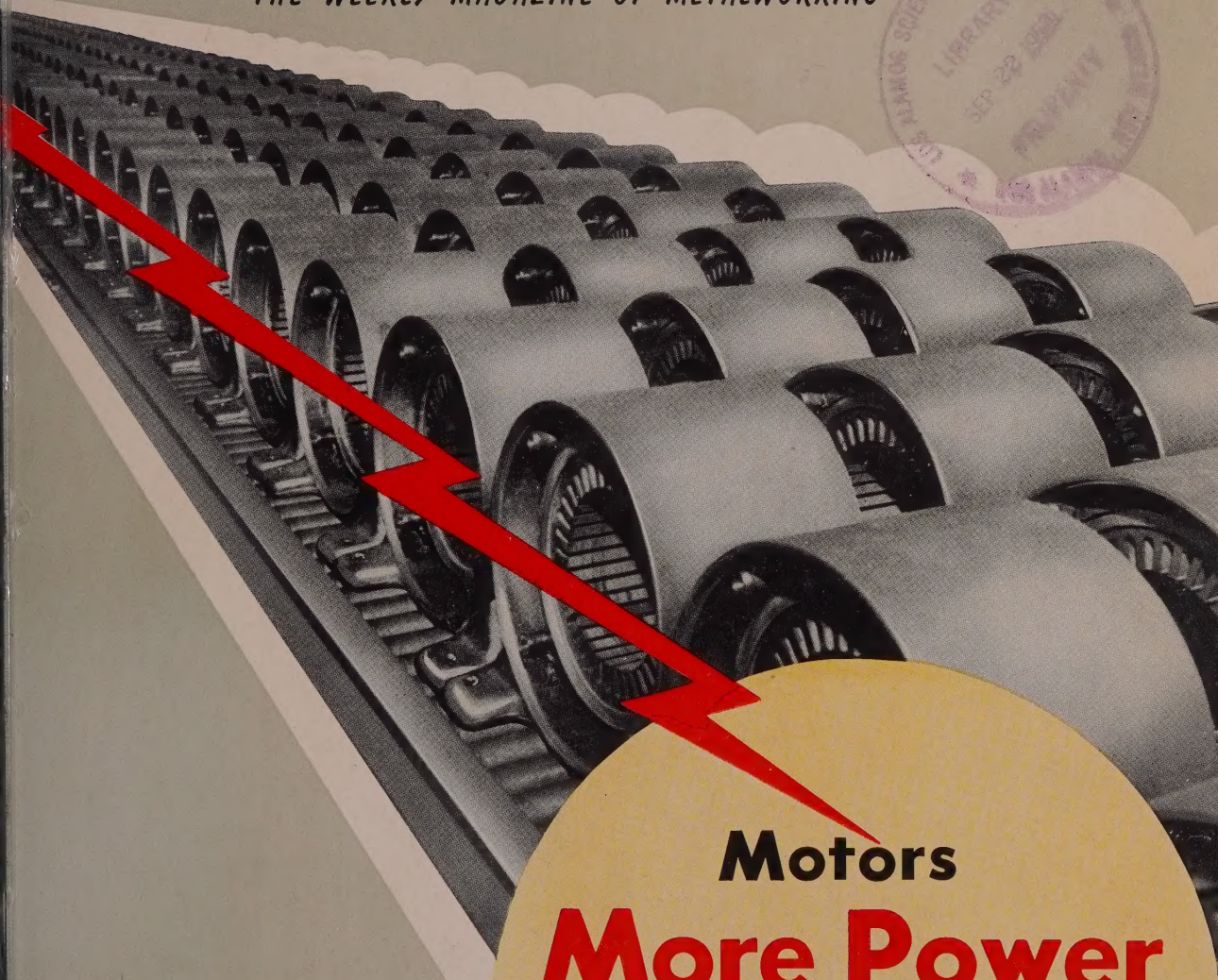
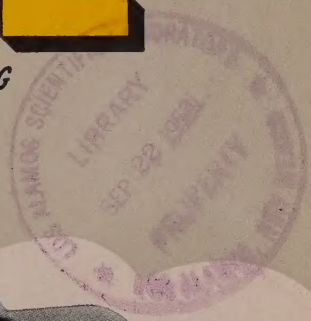


7
SEPTEMBER 21, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



Motors More Power Per Pound

Progress Shrinks Frames, p. 128

INVENTORY SHAKE-OUT
Adjustment, No Recession, p. 85

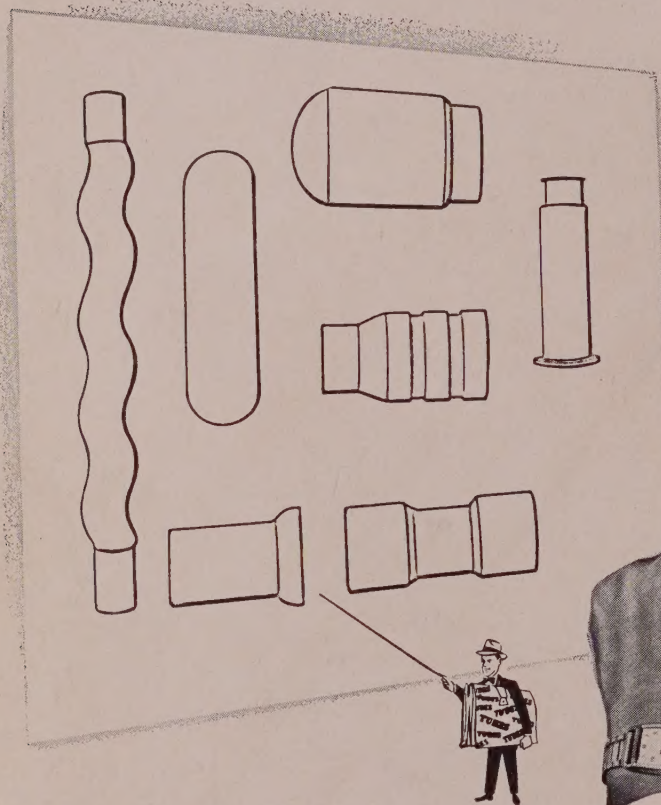
METAL FOIL
Prospects Shiny, p. 87

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Take a closer look at the

FORMABILITY

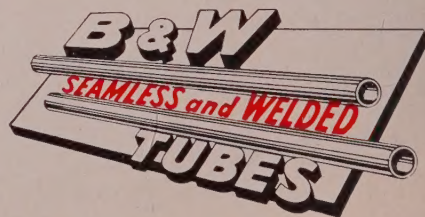
of B&W mechanical tubing *You'll like it*



When selecting tubing for forming into any part or product, the fabricator should be certain that the tubing has the optimum combination of formability and structural strength required by the product . . . should also consider the ease with which it can be formed—hot or cold—with his available equipment.

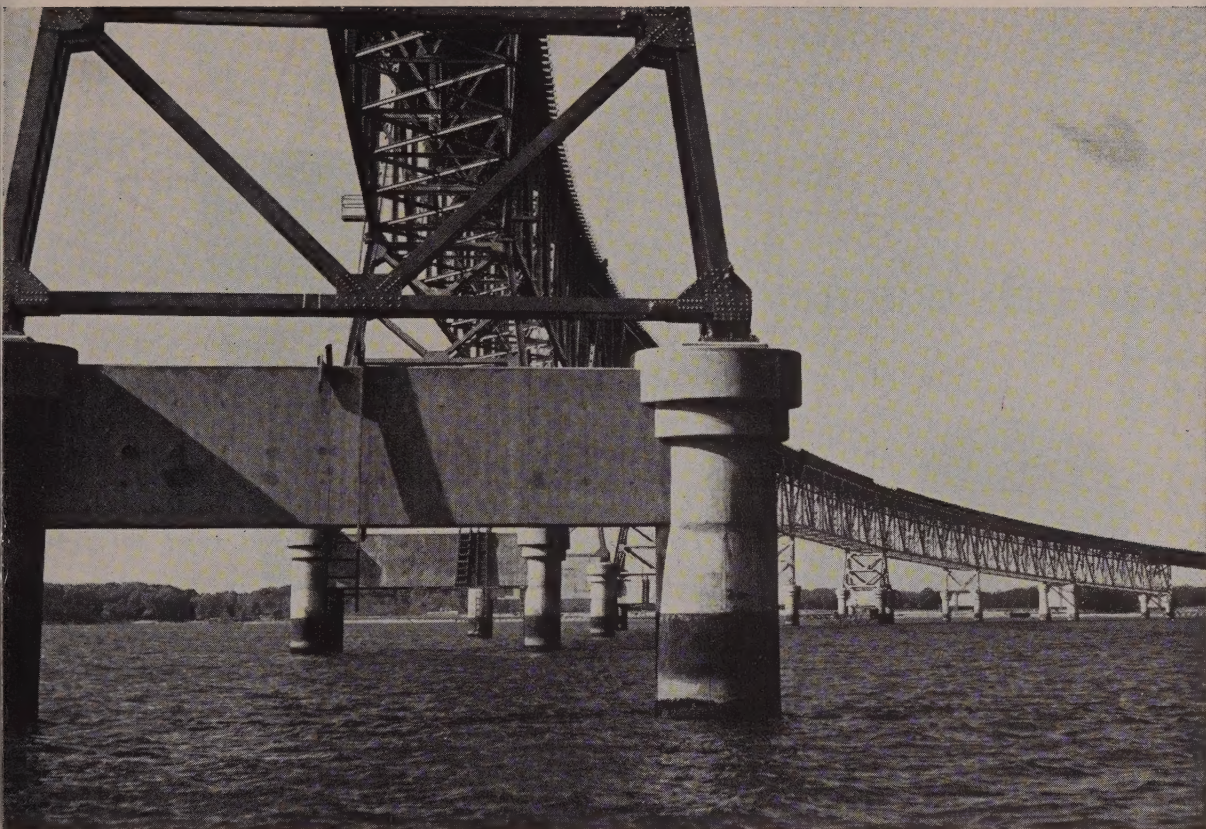
Whether you specialize in forming, or fabricate formed specialties only occasionally, B&W Mechanical tubing can be supplied to meet the specific requirements of practically any end use. It is available in the broadest range of analyses, sizes, finishes, and properties, to simplify and reduce your forming operations to the minimum consistent with product requirements.

Mr. Tubes — your nearby B&W Tube Representative — is always available when you need help in matching tubing types to your facilities and job requirements. Get the benefit of his long, close association with mechanical applications of every type, to keep your production up and costs down.



THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



The Chesapeake Bay Bridge is the third longest in the world, and the first to span Chesapeake Bay. Owner: Maryland State Roads Commission. Designers and Supervising Engineers: J. E. Greiner Company. Fabricators and Erectors of Superstructure: Bethlehem Steel Company.

Bridge Piers Protected by Mayari R Cylinders

Fifty-seven of the concrete piers that carry the Chesapeake Bay Bridge are protected by Mayari R steel.

The circular concrete shafts of these piers are encased in cylinders of Mayari R plate, extending from a point 5 ft above the mean water line to a point 5 ft below on some, and 2 ft below on others depending upon the location. Mayari R plate is also used to enclose the concrete web members that connect some of these shafts at the water line. These plate sections were fabricated and welded on shore, then lowered into position, where they served as forms for pouring tremie concrete.

These steel sections protect the concrete from any damage that might be

caused by floating objects, or by the action of salt water. Mayari R was selected because of its excellent resistance to corrosion and abrasion.

Tests made in industrial atmosphere as well as in brine solutions show that Mayari R has better corrosion-resistance than iron, carbon steel, or copper-bearing steel. For more information on the corrosion-resistance and mechanical properties of low-alloy, high-strength Mayari R get in touch with any Bethlehem Sales office.

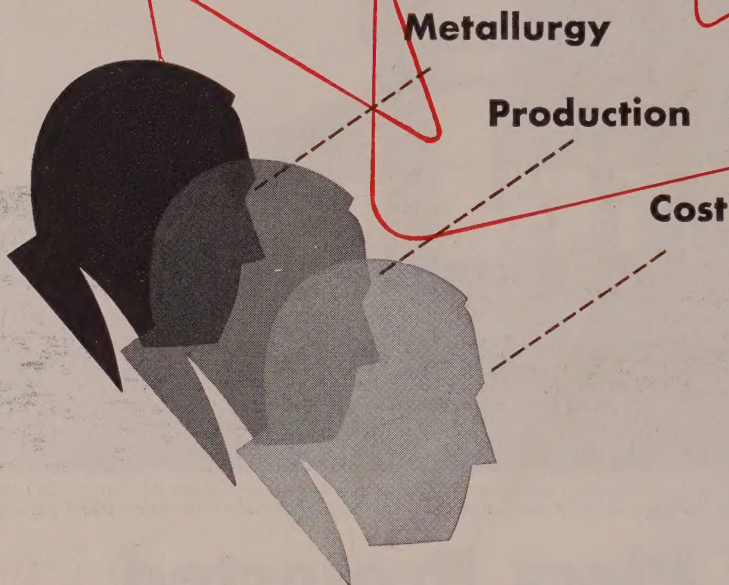
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation. Export
Distributor: Bethlehem Steel Export Corporation

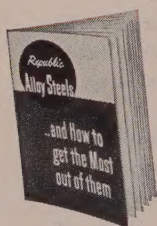


Mayari R *makes it lighter... stronger... longer lasting*

YOUR STEEL QUESTIONS HAVE 3 FACES...



REPUBLIC 3-DIMENSION METALLURGICAL SERVICE



WRITE for this booklet of case histories on "Republic Alloy Steels, and How to Get the Most Out of Them."

LOOKS AT ALL THREE—Whatever you make . . . or plan to make . . . these 3 questions dictate your decision on steel grades. When leading fabricators, small or large, have any question about the right answer, they call in a Republic Field Metallurgist. They know that his final recommendations on alloys, machining, and heat-treating procedures will include the opinions of the other two members of the Republic 3-Dimension Metallurgical Service team . . . a Mill Metallurgist and a Laboratory Metallurgist.

Your metallurgist and production manager may be stumped by a steel problem. Or may want confirmation of steel grades or heat treatment. Ask your Republic salesman to call in Republic's 3-Dimension Metallurgical Service. It is yours to use.

REPUBLIC STEEL CORPORATION

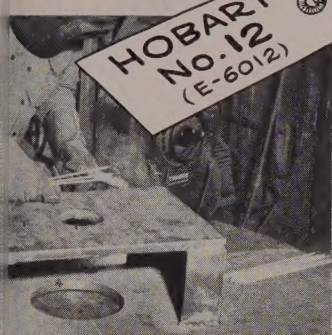
Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.



Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

HOBART



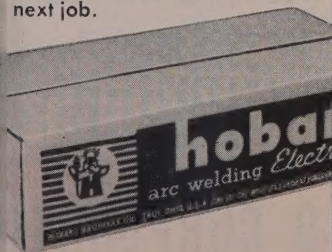
HOBART
No. 12
(E-6012)

is multi-purpose elec- simplifies your work

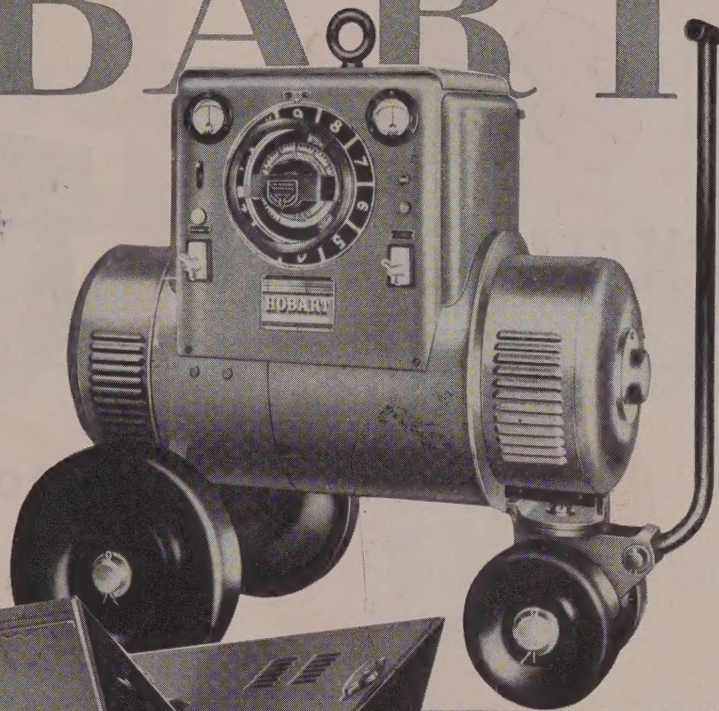
Hobart "12" is the best all-
electrode money can buy. It's
ed for welding in any position,
critical or overhead.

y of the country's largest fabri-
of tanks, automobile frames,
tural implements, etc., have
dized on the Hobart "12"—
e it handles over 80% of all
roduction work. One of the
asons for the "12's" success
it can operate efficiently on a
gh welding current, making it
e to increase welding speeds.
under these high currents, the
xhibits a smooth, stable arc,
remarkably low spatter loss,
means a big savings on stub
d cleanup time—while you get
eposited metal per electrode.
Hobart "12" is outstanding for
roduction and fabrication
t's equally efficient for main-
e work too, because its ductility,
strength, and unusually high
n physical strength are well
the minimum requirements.

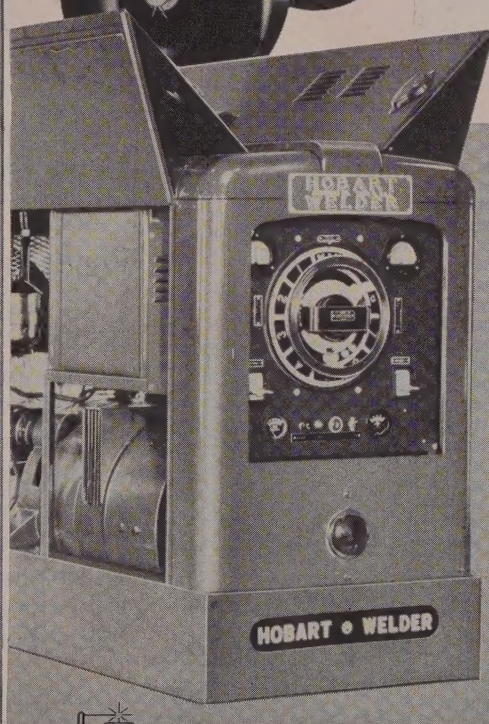
another example of how a
electrode is designed to give
ter, faster welds at lower cost.
ot give it a chance to prove its
on your work? Check and mail
today for free samples to try
next job.



Simply tell us about your
work and we'll recom-
mend the electrode best
suited to your needs—
and send you **FREE** sam-
ples to try on your next
job. Fill out and mail
coupon today.



HOBART 300 amp.
electric drive portable or
stationary DC welder is
the choice for 9 out of 10
production jobs. Hobart's
simplified controls make
it very easy for your
men to use.



HOBART 300 amp.
Gas Drive DC
welder is the standard of
the contracting industry
and is also used by the
Government and all
branches of the Armed
Forces where fast, de-
pendable performance is
a must.



Hobart Brothers Company
Box ST-93 Troy, Ohio

"One of the world's largest builders of arc welders"

HOBART BROTHERS COMPANY, BOX ST-93 TROY, OHIO

Without obligation, please send information on items checked below.

- | | |
|---|--|
| <input type="checkbox"/> Gas Drive Welder | <input type="checkbox"/> Electric Drive Welder |
| <input type="checkbox"/> Pipeliner Welder | <input type="checkbox"/> Bantam Champ Welder |

Send me—☐ Electrode Samples ☐ Electrode Catalog ☐ Accessories Catalog

Our work is _____

Name _____ Position _____

Firm _____

Address _____

HOBART WELDERS, ELECTRODES

822

PIECES PER HOUR

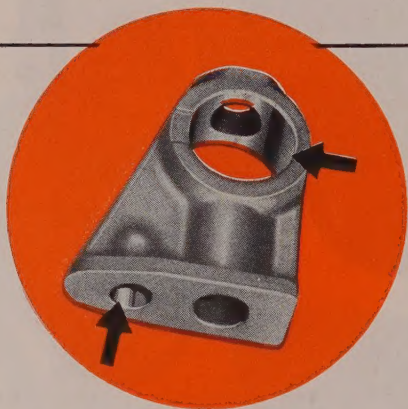
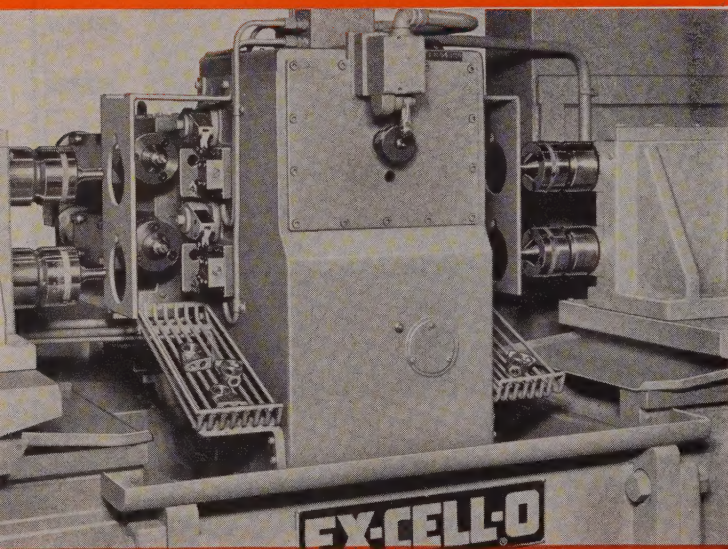
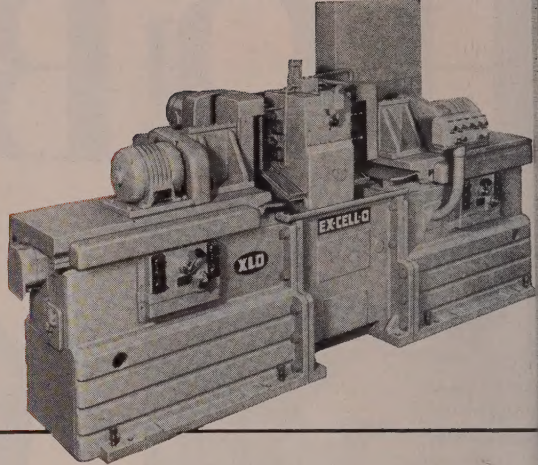


Photo above shows one of the die-cast aluminum workpieces. Arrows point to the bored holes which are held to plus or minus .0005". Four parts are machined during each cycle, netting 822 pieces per hour.



Two parts are held in each side of the fixture. Left and right slides bore $1\frac{3}{16}$ " diameter hole through each part, while rear slide is boring $\frac{5}{16}$ " blind holes at right angles to the others. The work is unclamped and ejected automatically at the end of the machining cycle.



FROM THIS

EX-CELL-O

3-Way Machine

Works From 3 Directions Simultaneously

This Ex-Cell-O three-Way Precision Boring Machine consists of three standard, self-contained way units joined to a center section. The left and right way units have two spindles each, mounted one above the other on angle plate brackets. The rear unit carries four spindles, two on each side. The center section supports a fixture accommodating two parts on each side. Work is clamped and ejected hydraulically.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines, or write today for Bulletin 31631.



EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

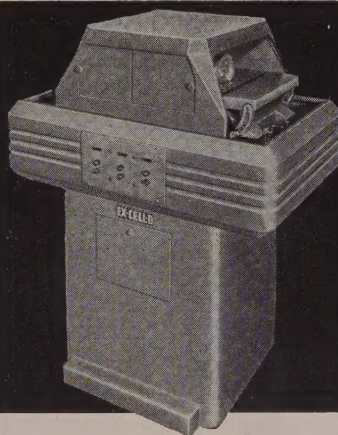
MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS
RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT
AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

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Editorial, Business Staffs 16. Advertising Index 232. Editorial Index available semi-annually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

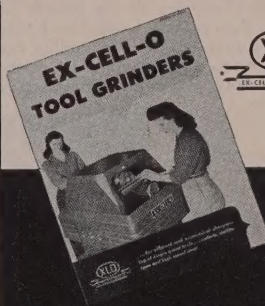
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year \$7.50; two years \$15; all other countries, one year \$20. Single copies (current issues) 50 cents. Metalworking Yearbook issue \$2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1953 by Penton Publishing Co.



This Sturdy Precision Tool Grinder

STYLE 44-A, is the newest in a complete line made by Ex-Cell-O for sharpening carbides, high speed steels, and cast alloys. All are double end models, equipped for face grinding on cup type wheels; for efficient and economical conditioning of single-point tools.

BULLETIN 46262, pictured below, shows and describes models for large plants or small shops; also gives important data on tool grinding. Ask Ex-Cell-O to send you a free copy. Write for it today.



53-27

For Better Work and Longer Life—

TOOL GRINDERS

BY

EX-CELL-O CORPORATION

Detroit 32, Michigan

what's
NEW

in Engineering

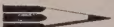
An automatic welding machine, developed by a Michigan company, is claimed to duplicate the work of dozens of human welders. The octopus-like machine generates temperatures of 2000° F.; is water cooled. One operator can make 62 simultaneous welds with it. In one minute it can perform 744 weld operations.



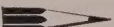
Reducing coke consumption while increasing pig iron production was the dual problem facing Kaiser Engineers in designing and building blast furnaces for a California steel plant. A courageous new furnace



design gave record results—1335 tons of pig iron per day on furnaces rated for 1200 tons. These furnaces use 1409 lbs. of coke per net ton of iron against a national average of 1600-1700 lbs. per ton. We'll send you a reprint of an article by Dr. W. C. Rueckel which tells how Kaiser Engineers attained this outstanding furnace practice—with savings in capital and operating costs through increased production.

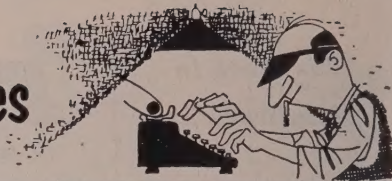


Simplified Drafting Practice, by Healy and Rau, is a best-selling new book which outlines a modern approach to industrial drafting. The method claims to cut drafting time 30-50%; reduce large blueprints to handy pocket size.



For those clients who want general consulting engineering services, such as economic studies, evaluation, investigation of manufacturing facilities, or analysis of operating costs, the full engineering experience of Kaiser Engineers is available. Call or write: Kaiser Engineers Division of Henry J. Kaiser Company, Kaiser Building, Oakland 12, California.

behind the scenes



Good Old Days?

In a couple of minutes, you can turn a few dozen pages to the east of here and find out what is happening and what will happen in metalworking, but first let's take a few seconds to recall what has occurred.

We've just been down to the archives, perusing the Sept. 18, 1933, issue of STEEL. That issue of 20 years ago reported that the steel ingot operating rate had dropped to 41 per cent of capacity; it's in the 90s now. Two decades ago, STEEL reported, July auto and truck production was 233,088 units; it was 757,595 this July. The Sept. 18, 1933, book reported freight car loadings at 666,652 in the week ended Sept. 2; they're topping 800,000 a week regularly now.

Feel better? Well, then, the steel industry's basic labor rate two decades ago was 40 cents an hour. It's \$1.52 now.

You Never Know

While we're in this reminiscing mood, let's jump five years ahead in time. Lo and behold, in Behind the Scenes, of all places, on Sept. 19, 1938, we come across this bit of information:

"A reader predicts that the government will spend over \$1 billion a month in 1939."

Then this character, Shrdlu, went on to be slightly skeptical. Shrdlu, you fool. The government is spending about \$1 billion a week now on defense alone.

Hurrah for LDAWLWCA

We are in receipt of an epistle which, after the conventional address at the top, starts off without the age-old Dear So and So. Instead, the author gets right down to business and says: "Your problem of Sept. 7, Shrdlu, took a full four minutes of skill and ingenuity by the undersigned. Please, let us have some easier problems." The letter then ended with the gentleman's signature, minus that age-old "Very truly yours," "Sincerely yours," etc.

We liked the letter. We liked the style. Why say, "Dear Ignatz," when

you never cared much for Ignatz anyway? And why say you are truly his, when you belong to no man? We hereby form an organization entitled, Let's Do Away with Letter-Writing Conventions of America Inc.

If you want to be a member, all you need do is write us an epistle—without the tedious conventions—stating that you want to join LDAWLWCA, and we'll add you to our rolls. If we receive your letter within 60 days, you can be a charter member and a vice president, too. Next year, we're going to tackle the matter of reforming the spelling.

Music, Comrade

Our European correspondent Behind the Iron Curtain reports that Soviet bards have decided to sing more emphatically about heavy industry.

At a conference of poets and composers it was decided to produce, among other inspirational choruses, a "song of the smelters;" a "consomol metallurgical song" and a "song of subway building."

Swing it, boys, swing it.

Puzzle Corner

The puzzle of Sept. 7 on lentils, was simple, as our LDAWLWCA man implied. It takes 29 days to cover the area with two lentils.

Since we have been in a sort of reminiscent mood for part of this column this week, let's go way back to classical days for our next puzzle:

Heracles, the mighty, was questioning Augeas, seeking to learn the number of his herds. Augeas replied: "About the stream of Alpheius, my friend, are the half of them; the eighth part pasture around the hill of Cronos, the twelfth part far away by the precinct of Taraxippus; the twentieth part feed in holy Elis, and I left the thirtieth part in Arcadia; but here you see the remaining 50 herds." How many herds had Augeas?

Shrdlu



Open hearth back wall is repaired with BRI Gun and Roebling furnace stays on line 3 extra weeks

HERE is another instance in which a BRI Gun paid for itself on a single emergency job.

Shortly after John A. Roebling's Sons Corporation placed their BRI Gun in service, a section of the back wall near the skew in one of their open hearth furnaces began to erode. This section was repaired with Gundol and Gunchrome M and the furnace kept on the line for three weeks, until the furnace went down for a scheduled rebuild.

Now, fourteen months later, practically all Roebling furnace personnel are expe-

rienced in the operation of the BRI Gun and use the equipment regularly. Consequently, furnace life has been increased and the problem of skewback maintenance virtually eliminated.

Roebling's experience confirms that of the several hundred BRI Gun owners who have found the equipment easy to operate, cheap to maintain and highly effective for making emergency as well as routine repairs.

If you are not yet sold on the gun and on Gunchrome, Gundol and Gunmix, why not ask your Basic representative for the whole story?

GRANULAR BASIC



REFRACTORIES

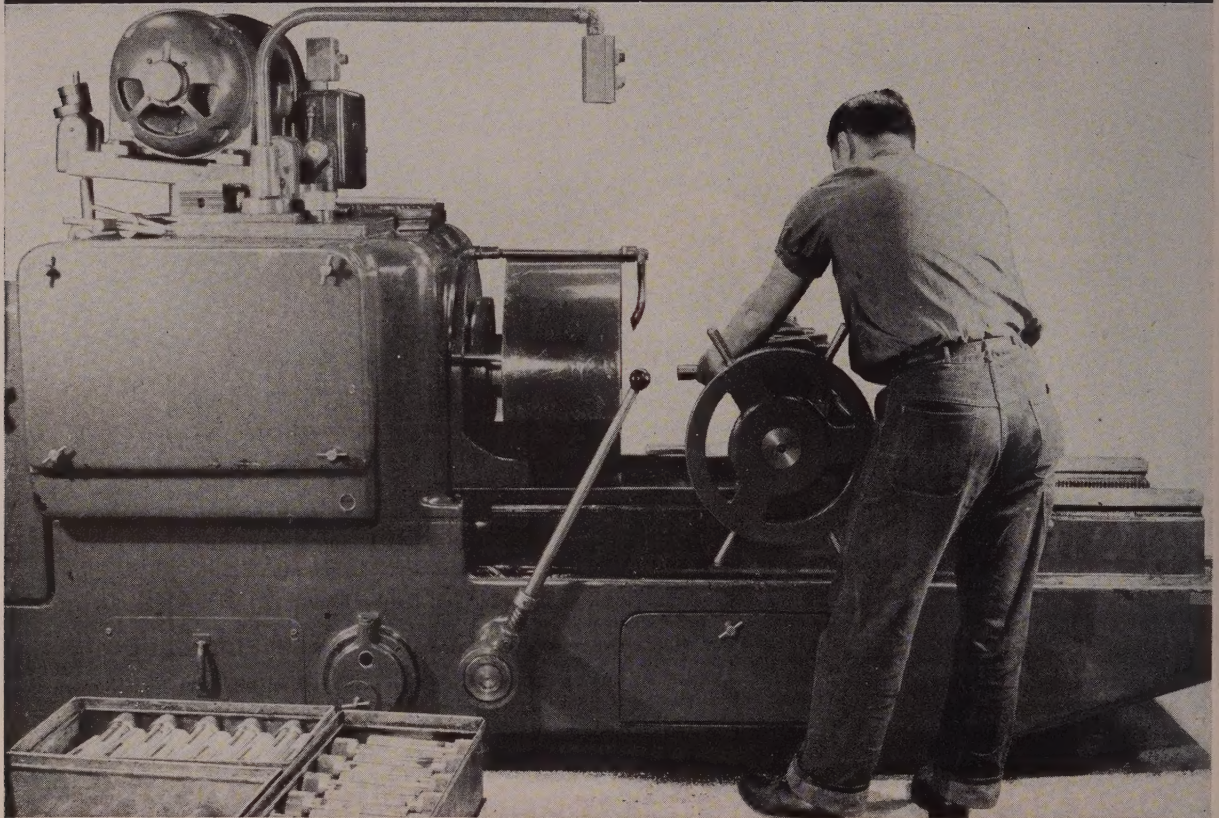
Basic Refractories Incorporated

845 HANNA BUILDING, CLEVELAND 15, OHIO

Exclusive Agents in Canada: REFRACTORIES ENGINEERING AND SUPPLIES, LTD., Hamilton and Montreal

A NEW **LANDMACO**

for Cutting Large Diameter Threads



HARDENED and GROUND WAYS • WIDE SPEED RANGE • 60% MORE GRIPPING POWER • 6" CAPACITY

A New LANDMACO Threading Machine with many improvements and new design features has been developed for heavy-duty precision threading on large diameter work. The first installation of this new LANDMACO is shown threading "Unbrako" socket head screws of TS4140 steel at the Standard Pressed Steel Company, Jenkintown, Pa. 1½" diameter 12 pitch UN threads are being cut 2 29/32" long to a Class 3 fit.

The carriage front, based on a new principle, assures proper work alignment under gripping pressure and gives 60% more gripping efficiency. Heavy hardened and ground rectangular ways firmly guide and support the carriage.

A single gear shift lever is provided for a rapid speed change of 25% for any given spindle speed as determined by the speed change gears

in use. Three pairs of speed change gears provide twelve spindle speeds ranging from 9 to 152 revolutions per minute.

This machine is equipped with either the 4" Standard Rotary Head or the new 6" (6-chaser) Lanco Head. It will cut bolt threads from 1½" to 6⅝" in diameter, and pipe threads from 1" to 6" in diameter. Maximum thread length is 29" with leadscrew and 30" without leadscrew.

For more complete information on this new LANDMACO Threading Machine, write for Bulletin #H-45.

381

THE **LANDIS Machine CO.**



**WAYNESBORO
PENNSYLVANIA**

NATIONAL METAL EXPOSITION THE BIG METAL SHOW



Champion - in the
Metals Market Place of the World!

**NATIONAL
METALS EXPOSITION**

**NATIONAL
METAL CONGRESS**

Unmatched anywhere in the world for intensity of interest . . . for wealth of ideas and basic appeal . . . the National Metal Exposition in Cleveland's Public Hall this October, will be host to another record-breaking audience of metals industries people . . . intent upon seeing the newest . . . the finest . . . the most wanted developments America's industrial genius has created. For every man interested in metals, this champion of all industrial expositions offers *more of everything!*

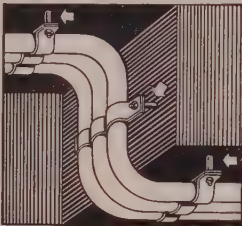
CLEVELAND, OHIO • OCTOBER 19-23

 <p>END-WELDS STUDS TO STEEL IN A SPLIT-SECOND</p>	 <p>ELIMINATES DRILLING, TAPPING, HAND WELDING</p>	 <p>REDUCES MATERIAL HANDLING—TAKES THE TOOL TO THE WORK</p>
	 <p>SAVES STEEL—ELIMINATES HEAVY BOSSES AND FLANGES</p>	 <p>IMPROVES PRODUCT DESIGN AND QUALITY</p>

TAKE ADVANTAGE OF NELWELD COST SAVINGS IN STEEL FABRICATION

TO HANG....TO HANDLE....TO HOLD..

Faster installation of brackets or hangers for piping, tubing or conduit.



Fast installation of handling accessories that can be easily removed.



Split second stud welding lowers fabrication costs, improves product.



THE NELSON FASTENING ENGINEER WILL SHOW YOU



... right in your own plant how your production and your products can be improved with this modern fastening method. Your design and production men can actually participate and test the results on your own products.

For full information on Nelweld as applied to steel fabrication, write the Main Office, Lorain, Ohio.

Fasten it Better...at Less Cost, with

NELSON STUD WELDING

DIVISION OF GREGORY INDUSTRIES, INC., LORAIN, OHIO



LETTERS TO THE EDITORS

Foremen Hold the Key



I would like to receive the monthly "Employee Relations Bulletin" in which appears from time to time the "Scrapbook for Supervisors" compiled by the National Foremen's Institute.

This bulletin is mentioned in your article "Your Key to Good Plant Discipline: The Foremen" (Aug. 24, p. 49). But no address is given from which to order.

Marvin Van Kirk
foreman, Forge Division
Ingersoll-Rand Co.
Phillipsburg, N. J.

• For information on the monthly "Employee Relations Bulletin" write: A. C. Crott, president, National Foremen's Institute, New London, Conn.—ED.

Being regular subscribers to STEEL, we have noted with interest the article entitled "Your Key to Good Plant Discipline: The Foremen". We'd like 24 reprints if they're available.

K. M. Dewar
superintendent underground mining
Steep Rock Iron Mines Ltd.
Steep Rock Lake, Ont.

Please send me 25 copies of this article . . .

Orvid G. Erickson
assistant personnel manager
Black-Clawson Co.
Hamilton, O.

Would you please send me 25 tear sheets . . .

G. E. Klock,
plant manager
Sylvania Electric Products Inc.
Emporium, Pa.

• Sent.—ED.

Miss the Car of the Week?

I have enjoyed the feature article in your magazine called "Mirrors of Motordom" and the feature for some weeks called "Car of the Week." At the conclusion of this series in the Aug. 14 issue I find that I don't have the complete 18 articles.

I would appreciate having tear sheets of the articles dealing with the following cars: Packard, Chevrolet, Chrysler, Dodge and Hudson.

Joe J. Summers
Commercial Engineering & Products Co.
Houston, Tex.

• Sent.—ED.

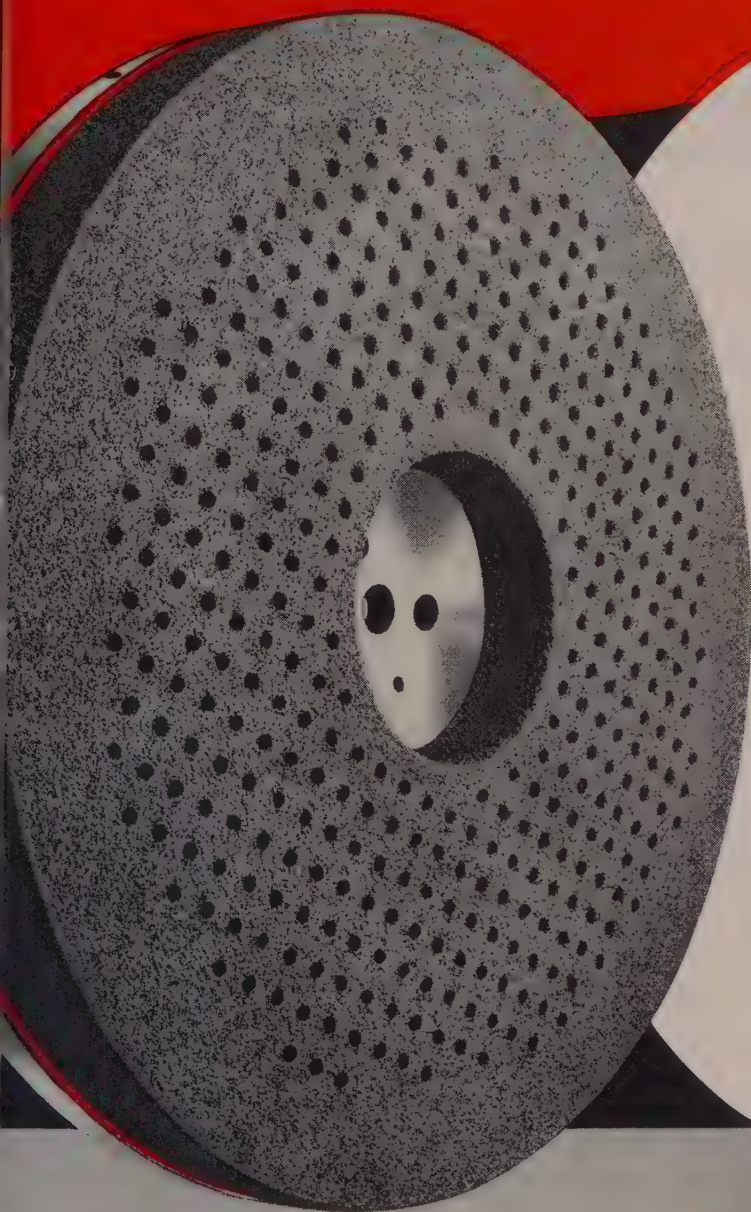
Challenge to Open Hearths

We noted with great interest your article entitled "Open Hearth Challenged as More Carbon Steel Goes Electric"

Please turn to page 12

Gardner Abrasive Engineering

**Combining two grades in one disc
reduces costs and gives longer disc life**



THE PROBLEM

To maintain a flat, true surface on the abrasive disc. Use of a single grade with deep corrugated face proved unsatisfactory. Outer edge of disc wore rapidly in shear cutting operation. Result: a tapered disc face, poor accuracy, frequent dressing.



THE SOLUTION

A harder grade was used for shear cut on the smooth outside area and a softer grade for the corrugated area on the inside. Result: Maximum stock removal with fast, cool cutting. Tolerances improved. Discs required less frequent dressing—lasted longer.

Gardner Abrasive Engineering offers experience derived from making both the grinding machines and the abrasive discs. It considers machine performance first and then evaluates how grade and grain of abrasive or type of disc affect grinding results. If standard abrasive discs won't do the job, discs are made *just for you*.

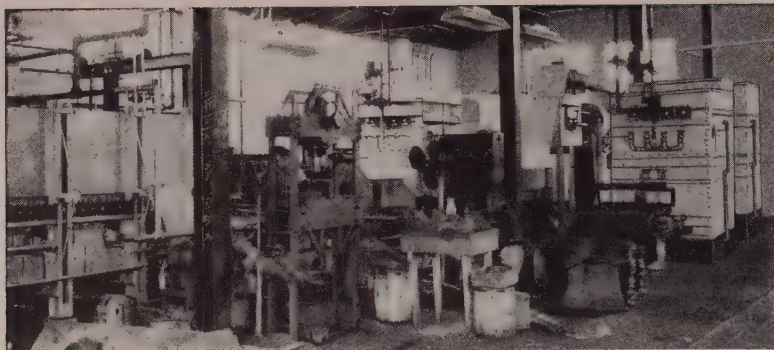
For help with your grinding problem, consult the Gardner Abrasive Engineer.

112A

GARDNER MACHINE COMPANY
420 Gardner St., Beloit, Wisconsin, U.S.A.

GARDNER

abrasive
discs



Niagara Aero Heat Exchanger quickly pulls down the initial peak load of heat in quenching . . . and saves cooling water

Accurate control of quench bath temperatures and quickly effective capacity to handle the initial peak load of heat in quenching prevents production set-backs, increases the output of your heat treating department, prevents oil fires, saves you losses from rejected parts.

Niagara Aero Heat Exchangers give you this control in both furnace and induction hardening methods. They prevent both over-heating and over-cooling of the quench bath. Hundreds of heat treaters know they prevent many troubles, constantly improve quality and increase production.

They quickly pay for themselves by saving cooling water coils and extend your quench capacity without extra water or cooling tower.

Write for Bulletin #120 giving complete information.

NIAGARA BLOWER COMPANY

Over 35 Years' Service in Industrial Air Engineering

Dept. S., 405 Lexington Ave.

New York 17, N. Y.

Experienced District Engineers in all Principal Cities of U. S. and Canada

LETTERS

Concluded from page 10

(Aug. 24, p. 84). This is to request that you grant us permission to reprint this article for circulation in this country and in Canada.

C. G. Ollinger
assistant manager
Advertising & Sales Promotion Department
National Carbon Co.
New York

• *Permission granted.—ED.*

We would appreciate 20 reprints of the article . . .

J. W. Bowman
director of purchases
Northwestern Steel & Wire Co.
Sterling, Ill.

One More Plant in the Count



Since we are producers of carbon steel and stainless steel strip, we think we should be listed in your pages recording steel prices and stainless steel mill prices. Should you agree, please advise what information you require.

Irving J. Jacobs
assistant to president
Rodney Metals Inc.
New Bedford, Mass.

• *We will be happy to include your quotations on carbon and stainless steel strip. Will you please let us know what stainless steel and carbon steel products you are marketing and what applicable current prices you are quoting. Rodney Metals Inc. will be included in STEEL's price pages, beginning with Sept. 14 issue.—ED.*

Conservation U.S.A.

The article "Vacuum Process Brightens Plating Picture" (Aug. 17, p. 166) is of special interest to personnel engaged in the materials conservation program of the U. S. Army Corps of Engineers.

It would aid our program if we could receive 70 copies of this article for distribution to laboratories, procurement offices and engineers of the Engineers corps. If reprints are not available, we would appreciate your permission to locally reproduce this article in exact detail for the same purpose.

assistant, procurement division
Military Supply
Office of the Chief of Engineers
Department of the Army
Washington

• *Permission to reproduce the article is granted.—ED.*

How To Coat Aluminum

We are quite interested in aluminum coating and would like to obtain 40 or 50 tear sheets of your article "Use the Right Process for Coating Steel with Aluminum" (Part One, Aug. 3, p. 98 and Part Two, Aug. 10, p. 138).

R. H. Shoemaker
vice president
Kolene Corp.
Detroit

• *Due to a large demand for these articles, we are able to send only 10 copies.—ED.*



Weirzin

ELECTROLYTIC ZINC-COATED STRIP

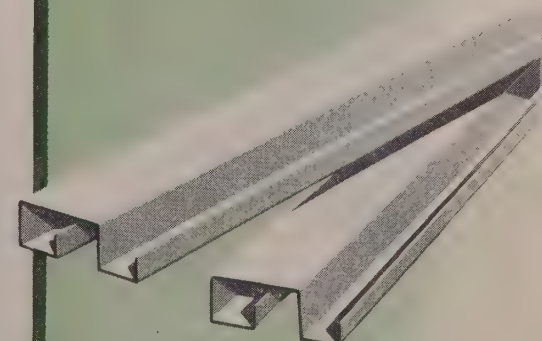
Cuts manufacturing costs!

- Speeds production
- Increases die life
- Reduces die maintenance

From the first day you use Weirzin you will find a marked reduction in manufacturing costs. Your production rate will increase with less time spent on die maintenance and replacement. The tight zinc-coating, electrolytically applied to Weirzin steel, actually lubricates dies without leaving a zinc deposit—thereby reducing die maintenance expense and lengthening die life.

One fabricator reported a 300 per cent increase in production per set of dies after changing to Weirzin from ordinary carbon steel. This is an economy factor too great to be ignored.

Add to this the fact that the zinc coating on Weirzin will not flake, peel or powder under the most severe fabricating operations and you will quickly realize what production economies Weirzin has to offer. Write today for further information on how Weirzin can cut your manufacturing costs—and make your product a better one.



WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL



CORPORATION





Hairsplitting on a mass production basis!

This workpiece is positioned automatically, bored to limits within .0002", yet handled on a production basis. It's a routine job for the versatile G&L 340-T Horizontal Boring, Drilling and Milling Machine with Automatic Electric Positioning Device.

You can increase the efficiency of boring, drilling or milling operations with this ultra-precision machine. Because of its open construction and outstanding rigidity, the G&L 340-T allows you to handle either large or small work with equal precision on both production and custom run jobs. It's extremely flexible. With it, you can perform multiple operations from a single setup . . . maintain close tolerances and parallelism even though table is fully extended.

Featuring 45 easily selected speeds and 36 feeds, this standard model table-type machine delivers 20 hp, has a 4" spindle, offers a choice of three basic table and saddle arrangements. Standard bed length is 72", headstock travel on the column is 36". Cross-feed of its 36" x 72" table is 60". Larger bed, column and table sizes are also available.

What's more, these versatile machines can be equipped with the G&L Automatic Electric Positioning Device. This unit eliminates many time-consuming hours for final hand adjustments for locating work. That's because it automatically controls table and headstock movements to precise, pre-determined settings.

For complete information, see your G&L representative or write —



**GIDDINGS & LEWIS
MACHINE TOOL CO.**

FOND DU LAC, WISCONSIN

Builders of the world's finest heavy-duty Horizontal Boring, Drilling and Milling Machines — table, floor and planer types; Hypro Double Housing and Open Side Planers, Planer Type Milling Machines and Vertical Boring Mills; and Davis Cutting Tools.

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BLADES & FRAMES

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CUTTING BANDSAWS

Back of every Star Blade are 75 years of metal cutting experience. When you ask for Star, you get a product made of the finest steels available. You get a product made on specially designed equipment which assures *uniformity*, shipment after shipment.

Your nearby Industrial Distributor is the man to call for Star Metal Cutting Blades. He is your logical source of supply not only for Star Blades, but for all the industrial supplies you need regularly and *quickly* to keep your production running on schedule.

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Makers of Hand and Power Hacksaw Blades,
Frames, Metal and Wood Cutting Band
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New facts for your file on



U-S-S HIGH STRENGTH STEELS

U-S-S MAN-TEN steel ensures long life of vital parts by providing strength plus high resistance to wear

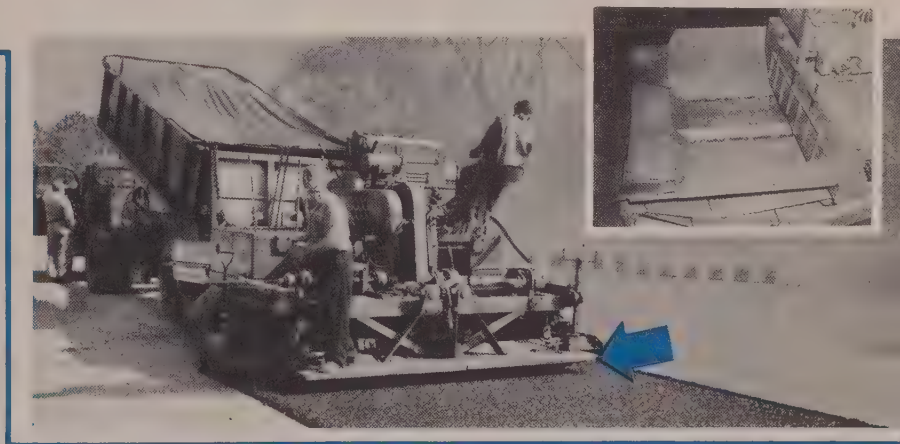
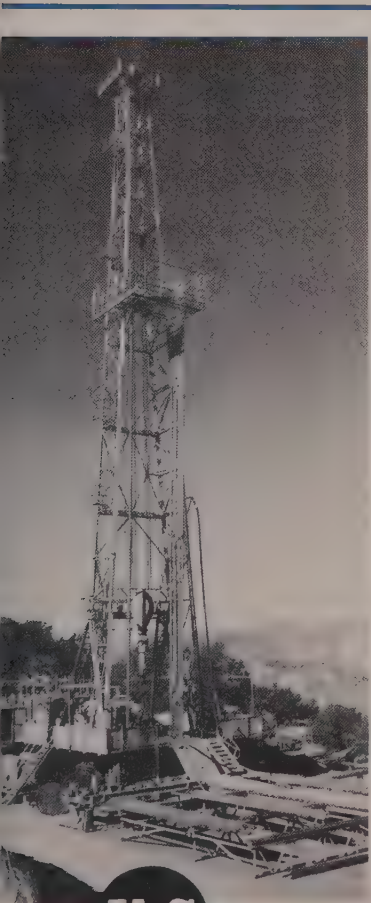
● Distinguished for its performance as a road paver, the Barber-Greene Finisher tamps, levels and strikes off simultaneously—provides an unusually efficient method for laying a compact, level course of bituminous mix.

Made of $\frac{3}{8}$ " MAN-TEN steel, accurately ground to flatness and highly polished, the screed plate (arrow), which rides on the laid pavement and gives it a smooth, ripple-free surface, is one

of the most important components of this unit. Says the manufacturer, "Much of the success of the paving operation and the ultimate quality of the road surface reflect the quality of the material and manufacture which goes into the screed plate. That's why we use U-S-S MAN-TEN steel."

The bed of the receiving hopper is also made of U-S-S MAN-TEN steel, $\frac{1}{4}$ " thick. After the load of hot mix is

dumped into this hopper, chain-mounted flights draw it across the bed plates. Abrasive action is severe and the bed plates take a beating so it is imperative that they be made of especially sturdy and long-wearing material. Again MAN-TEN steel fills the bill. Its relatively low cost and easy fabricating qualities further recommend MAN-TEN steel for applications of this kind, where strength and durability are of prime importance.



By saving weight in portable masts, U-S-S MAN-TEN steel cuts costs and saves time for the oil driller

Every pound saved is of vital importance to the users of this equipment. For every time a drilling derrick or portable mast is moved, the less it weighs, the less it costs to dismantle and ship to a new location.

With masts built 25% lighter with U-S-S MAN-TEN steel, trucking costs are substantially reduced. In moving a mast from Texas to Montana, for instance, the driller might easily save two thousand dollars or more.

But lighter MAN-TEN steel construction ensures even more important savings in the greater speed with which a mast can be lowered, placed on a truck, hauled to the next site and re-erected. Here, weight saving means time saving, which means more wells drilled—more money in the driller's pocket.

That's why Lee C. Moore Corporation cantilever masts and derricks have been built lighter with U-S-S MAN-TEN ever since

this high strength steel was first introduced twenty years ago. Used in the legs and principal structural members, in angle sizes ranging from 4" x 4" x $\frac{3}{8}$ " to 8" x 8" x 1 $\frac{1}{2}$ ", MAN-TEN steel replaces carbon steel of almost 25% greater thicknesses. Because MAN-TEN steel has a 50% higher yield point, this lighter construction is also stronger and, thus, has a greater pulling capacity. For example, a 136' high standard derrick with a 30' base constructed of 8" x 8" x $\frac{3}{8}$ " and 8" x 8" x $\frac{1}{2}$ " carbon steel leg members, weighs 42,000 pounds and has a pulling capacity of 465,000 pounds. On the other hand, a similar sized standard derrick built of MAN-TEN steel also weighs 42,000 pounds but has a pulling capacity of 645,000 pounds. In addition, MAN-TEN steel's 40% higher fatigue strength materially prolongs life by providing added durability.

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE ROPE CO., PITTSBURGH • PENNSYLVANIA STEEL INDUSTRIES, INDIANAPOLIS
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UNITED STATES STEEL

"Here's one place where



UNITED STATES STEEL



everything must be right"



Says William J. Holohan
U.S. STEEL MACHINIST

HERE in the machine shop of our Homestead Forgings Division the stakes are high. The responsibility is enormous. For here, forgings of all types and sizes—generator shafts, back-up rolls, drop hammer columns, ship shafting, etc.—receive their final “rough” or “finish” machining.

This is the wind-up for all the work that has gone before—the heating, forging, heat treating, the hundreds or thousands of man-hours. The success of the entire job is now in the hands of the machinist. He has to be good.

That's why men like William Holohan are in charge of all machining operations in our Forgings Division.

Holohan has been a U. S. Steel Machinist for 41 years. As an expert on the 12-foot vertical boring mill, he is carrying on a family tradition of fine steel making—following in the footsteps of his father, who retired as a Foreman after half a century of service.

These are the men who make your U·S·S *Quality* Forgings—men, working with the most modern equipment, whose skill and experience are combined to give you always the finest forgings that money can buy.

Send for our free 32-page booklet describing U·S·S *Quality* Forgings. Write to United States Steel, 525 William Penn Place, Room 2816-I, Pittsburgh 30, Pa.



Quality
FORGINGS

heavy machinery
parts — carbon,
alloy, stainless

electrical and
water wheel shafts

hammer bases
and columns

marine forgings

New facts for your file on

U·S·S CARILLOY STEELS

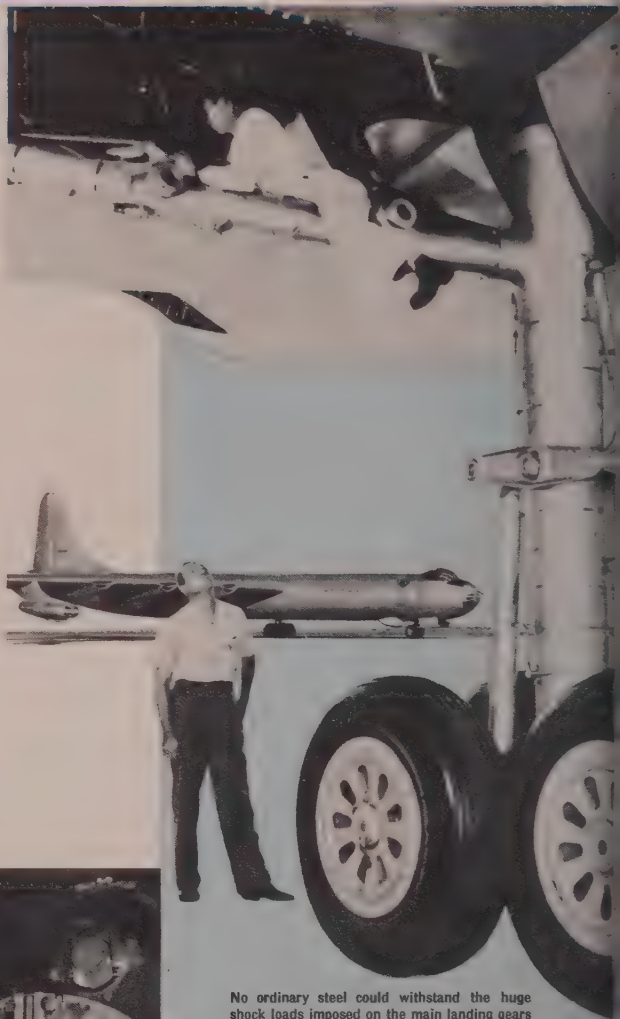
Every B-36 lands on U·S·S Carilloy steel

● When 179 tons of B-36 thump down on a landing strip, tremendous stresses are built up in the structural parts of the landing gear. Only the highest quality in steel can handle this tough job, which is one of the most exacting in the aircraft industry.

All of the rugged main columns for these landing gears are made from U·S·S CARILLOY electric-furnace aircraft quality ingots. This high quality alloy steel provides the great strength and shock resistance demanded in the performance of the finished part. The main columns for these landing gears are forged. The original ingot, as shipped to the forger, weighs approximately 37,500 lbs. From it are produced two columns, each weighing about 1200 lbs. In other words, approximately 93% of the steel has been removed—with a mere 7% of the original ingot left to do this tremendous job. Obviously, this steel must be of the very best quality.

The same care and skill go into every ton of CARILLOY steel that you buy, whether it's a giant alloy ingot or a few tons of special steel. Our experienced metallurgists keep a close check on every heat of steel to make sure it has the strength, hardness, toughness and machinability that's needed.

If you have a special steel problem, let us know. We'll be glad to help you with it.



No ordinary steel could withstand the huge shock loads imposed on the main landing gears of Convair's giant Air Force B-36 Bomber. The plane has a maximum gross weight of 338,000 lbs., with still higher landing shock loads. But U·S·S Carilloy steel has more than enough impact strength to hold up under this severe punishment.

U·S·S Carilloy electric-furnace aircraft quality steel meets every requirement for these vital parts. The precision machining and expert heat treatment they get at Cleveland Pneumatic Tool Company complete the job.



U·S·S

UNITED STATES STEEL CORPORATION, PITTSBURGH — COLUMBIA-BIRMINGHAM STEEL DIVISION, SAN FRANCISCO

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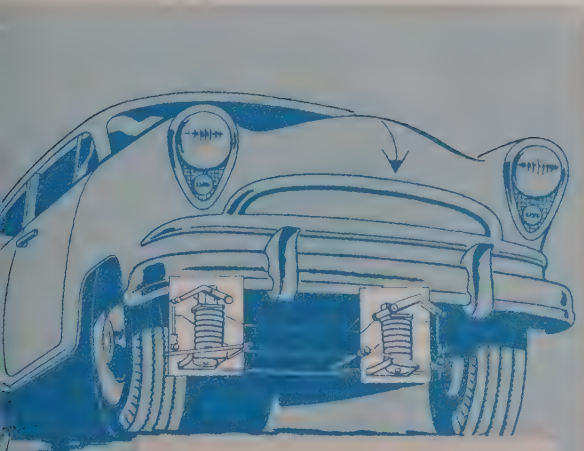
UNITED STATES STEEL

New facts for your file on

U-S-S CARILLOY STEELS

HALF THE NEW CARS HAVE COIL SPRINGS MADE OF U-S-S CARILLOY PRECISION ROLLED COIL SPRING ROUNDS . . .

- they are twice as accurate as ordinary hot-rolled bars
- require little or no centerless grinding
- and they cost less to use



● In the early days of the development of coil springs for front suspensions of automobiles, the only steel that was available was an ordinary hot-rolled bar from which as much as .035" of metal per side had to be removed by grinding to insure freedom from harmful seams, pits, and decarburization. This cost money, was wasteful and time consuming.

This seemed to be an expensive approach to a simple problem, so United States Steel equipped one of their mills to produce hot-rolled bars to eliminate harmful defects and most of the grinding expense. They devised a method for rolling a bar to half the standard tolerances, with half the amount or less of decarburization, which made it attractive to use the material "as furnished" or with a small amount of centerless grinding. We call this bar a Precision Rolled Coil Spring Round. It has performed excellently when used "as furnished" or with a small amount of grinding.

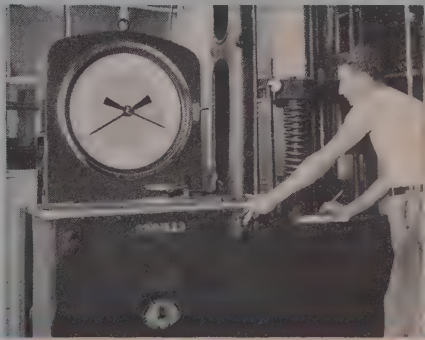
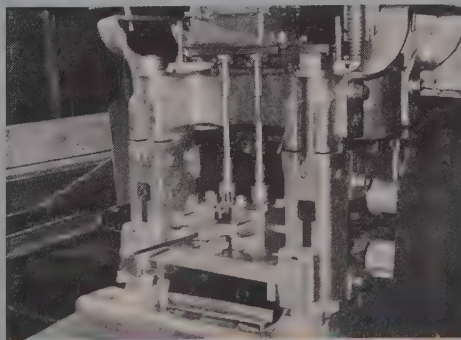
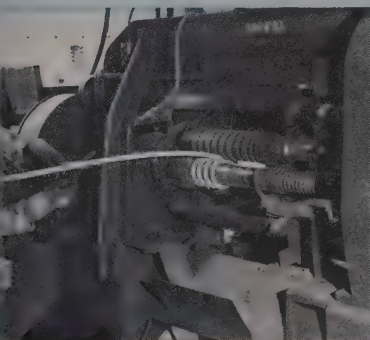
This exclusive development has paid off in two ways. It paid us because the CARILLOY Precision Rolled Coil Spring Round is now used in over half of the coil springs in new automobiles. But, most of all, it has paid off for the automobile manufacturer in that his costs are reduced with performance of the highest order. Today we are still hard at work developing new and better alloy steels for other new uses in automobiles; for example, in automatic transmissions, power steering units and other new and vital automobile parts.

Our experienced engineers and metallurgists will be glad to consult with *you* on any steel or fabrication problem. Just write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Here, at Muehlhausen Spring Division of Standard Steel Spring Co., precision rolled U-S-S CARILLOY Coil Spring Rounds are coiled without centerless grinding. CARILLOY Rounds have a guaranteed minimum decarburization, and they cost less to use.

At the Gary Works of United States Steel, this precision mill rolls CARILLOY Coil Spring Rounds with extreme accuracy. Tolerances are only half of standard; .004" on the diameter, instead of the usual .008", and only .006" out of round, compared to .012" on ordinary rolled bars.

Coil springs made of CARILLOY Precision Spring Rounds have been proved in severe laboratory tests, as well as in actual service on America's best automobiles. They perform so well that half of all automobile coil springs are now made of CARILLOY steel.



U-S-S

UNITED STATES STEEL CORPORATION, PITTSBURGH • U.S. STEEL CENTRAL OFFICE, CHICAGO, ILL. • U.S. STEEL DIVISION, SAN FRANCISCO, CALIF. • U.S. STEEL DIVISION, PHOENIX, ARIZ. • U.S. STEEL DIVISION, ALBUQUERQUE, N.M. • U.S. STEEL DIVISION, DENVER, COLO. • U.S. STEEL DIVISION, KANSAS CITY, MO. • U.S. STEEL DIVISION, LITTLE ROCK, ARK. • U.S. STEEL DIVISION, MEMPHIS, TENN. • U.S. STEEL DIVISION, MILWAUKEE, WIS. • U.S. STEEL DIVISION, MINNEAPOLIS, MINN. • U.S. STEEL DIVISION, ST. LOUIS, MO. • U.S. STEEL DIVISION, TAMPA, FLA. • U.S. STEEL DIVISION, WASHINGTON, D.C. • U.S. STEEL DIVISION, WICHITA, KAN. • U.S. STEEL DIVISION, YONKON, N.Y.

UNITED STATES STEEL

New facts for your file on

U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

Type 442 Stainless Steel performs well in firebox of oil-fired domestic furnace

● A prominent manufacturer is currently using U·S·S 21 (Type 442) Stainless Steel for the firebox assembly of its oil-fired domestic furnace.

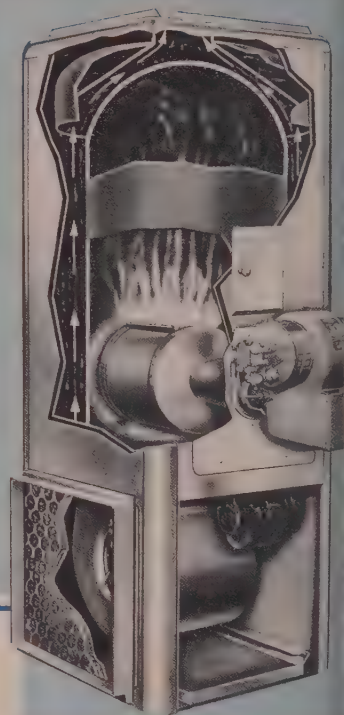
This oil-fired unit has a chamber, approximately 10 inches long and 12 inches in diameter, composed of a cylinder with an open top to which is spot welded a front cone and a rear cone. Operating temperature is 1600° to 1800°F.

When restrictions prevented the use of a nickel-bearing grade, this manufacturer turned to Type 442, a

straight-chromium grade of Stainless Steel. Type 442 has performed satisfactorily from the fabricating standpoint. There has been no trouble in drawing and forming, and its oxidation resistance is considered equal or superior to the nickel-bearing grade previously used.

Stainless Steel sheets used are 20 gage.

CROSS-SECTIONAL VIEW of an oil-fired furnace with its firebox of Type 442 Stainless Steel.



20-quart dishpans deep drawn from Type 430 Stainless Steel

THIS 20-QUART dishpan shows the excellent drawing characteristics of Type 430 Stainless Steel. It was made by Peal Manufacturing Company, Cincinnati, Ohio.

● Twenty-five thousand of these 20-quart dishpans have been manufactured for the Army Quartermaster Corps by Peal Manufacturing Company, Cincinnati, Ohio, using Type

430 Stainless Steel.

The 19-gage sheets are ordered to 26 $\frac{3}{4}$ " x 80 $\frac{1}{4}$ ", and are first sheared into a square and then into a circle. Two tapered-side draws form the pan, the end flange is folded in, the surface is ground, and handles of Type 430 Stainless Steel are welded to the pan.

Type 430 Stainless Steel has presented no problems in fabrication in this application.



HELPFUL SUGGESTIONS ON FABRICATION

Our book, "Fabrication of U·S·S Stainless and Heat-Resisting Steels," contains information that will be helpful to you, no matter what grade of Stainless Steel you are using. If you would like a copy, send your request to United States Steel Corporation, Room 2816-I, 525 William Penn Place, Pittsburgh 30, Pa.





The structural shop required a special crane

This 80-foot EDERER crane was "job-engineered" to the exact materials handling requirements of the structural shop in a large steel fabricating plant. One of the requirements was a 5-ton auxiliary hoist in addition to the 15-ton main hoist. As with all EDERER cranes, full welded girder construction, oversize parts, extra high safety factor all combine to make for maximum performance, minimum maintenance—economy all around.

EDERER—one of the largest crane manufacturers in the West—can "job-engineer" a crane to meet *your* particular requirements.

Write for Crane Bulletin CR-500

244C53

EDERER

CRANES

EDERER ENGINEERING COMPANY • 2935 First Avenue South • Seattle 4, Wash.

Export Division: 301 Clay Street, San Francisco 11, Calif.

OVER 50 YEARS "JOB-ENGINEERING" CRANES FOR INDUSTRY

Can you expect 38 years of service life from your silent chain drives?

Western Maryland Railway Company uses over three miles of belt conveyors in the big grain elevator shown below.

Sixty-five Morse Silent Chain Drives transmit power from motors of from 5 to 100 hp. to drive the belts which lift 15,000 bushels of wheat per hour or deliver 90,000 bushels per hour.

Long, long service life

Morse equipment was used in the original installation of the elevator over 38 years ago. The Morse Silent Chain Sprockets are still the original ones. So are the majority of the Morse Silent Chain Drives. The exceptions: The chain on the eight elevating legs and the chain on one of the long delivery belts were just replaced. Also, in 1922 an explosion wrecked a few drives, which were replaced and have been operating only 31 years.

See your Morse Distributor

Morse Silent Chain Drives are ruggedly built around the exclusive Morse Rocker Joint. They transmit power smoothly, noiselessly, with over 99% efficiency. Service life is unusually long and trouble free.

Do you want to reduce machine-down time? Want exceptional service life from your power transmis-



1914-19??

Morse Silent Chain Drive on one of eight elevating legs. Drive is 12" wide x 1" pitch. This is one of eight Silent Chain Drives just replaced after 38 years of service.

sion equipment? Want to reduce cost per hour of power transmission? Then see your local Morse Distributor about Morse Stock Silent Chain Drives—or Morse Roller Chain Drives, Morse Morflex Couplings, Morse Chain Couplings, and other Morse stock products. Look under "Chains" or "Power Transmission" in phone directory's yellow pages.



Long Service Life Engineering Service Quality—which you get in unusual degree when you buy Morse Power Transmission Products.

MORSE CHAIN COMPANY

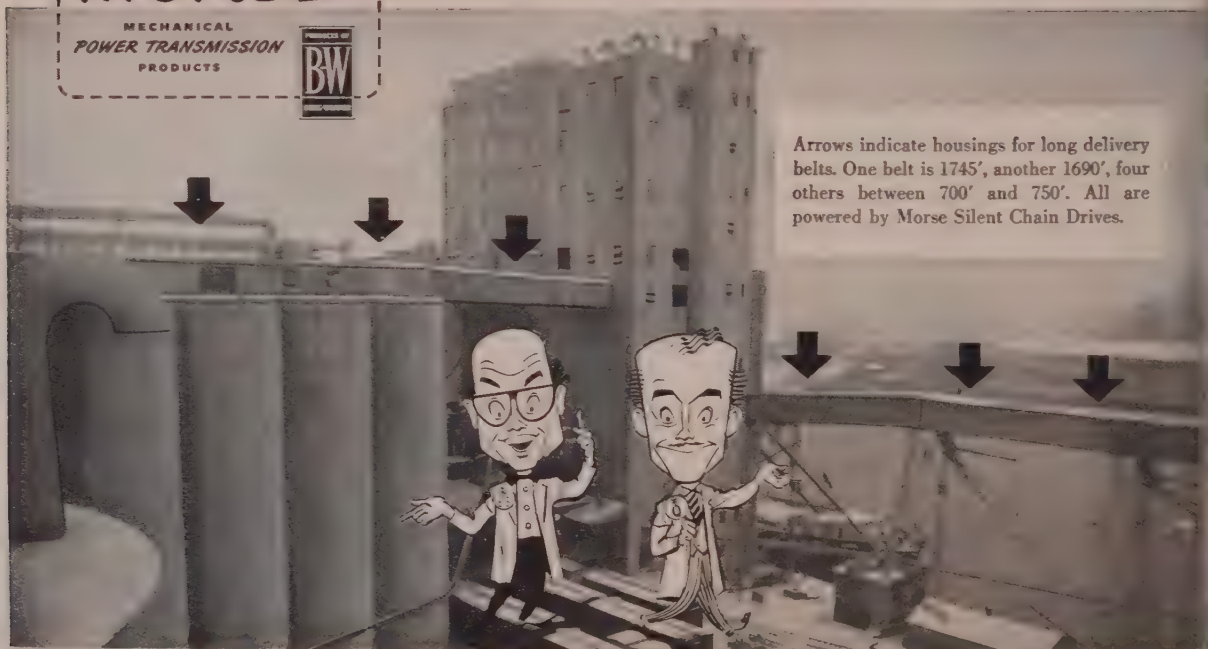
Dept. 532 • 7601 Central Avenue • Detroit 10, Michigan

MORSE

MECHANICAL
POWER TRANSMISSION
PRODUCTS



M=PT; Morse *means* Power Transmission



Arrows indicate housings for long delivery belts. One belt is 1745', another 1690', four others between 700' and 750'. All are powered by Morse Silent Chain Drives.

FORM GRINDING

JET ENGINE BUCKET ROOTS FROM THE SOLID!

ON J & L DUAL-WHEEL AUTOMATIC FORM GRINDERS



MATERIAL BORDERS ON UNMACHINABLE

Intense heat and great centrifugal stresses on the pressure surfaces require the roughest material and most accurate finish.

FEW MORE DIFFICULT GRINDING JOBS

EXIST — Yet both sides of the root are ground simultaneously, to gage tolerances, on a production basis.

REPETITIVE ACCURACY MAINTAINED

Spacing of pressure surfaces within .0002

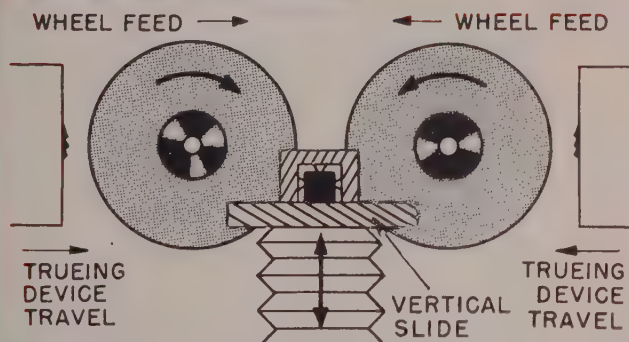
Taper within .0005

Angles within 10 minutes

Thickness from .0005 to .001

ACHIEVEMENT RESULT OF SEVERAL YEARS' RESEARCH AND EXPERIMENTATION

— This application of the proven principles, long incorporated in J & L Thread Grinders, was initiated several years ago. The first machine was delivered in 1948. Continued study and subsequent refinements have helped lick one of the toughest machining problems of our day. Perhaps we can help you too.



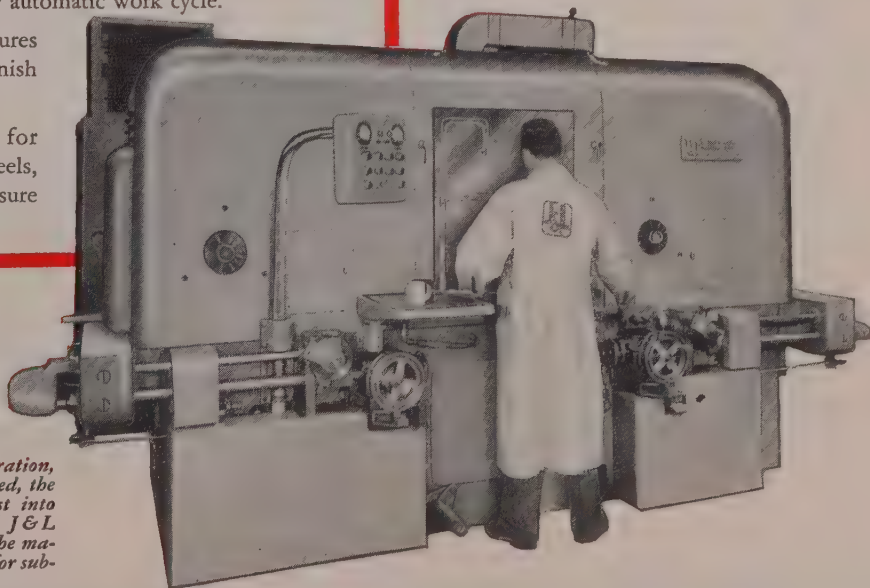
Bucket is mounted on a reciprocating vertical slide for two-way grinding.

AUTOMATICITY SPEEDS PRODUCTION — MAINTAINS

REPETITIVE ACCURACY — Operation is simplified to the push button stage by a completely automatic work cycle.

Automatic wheel truing assures accuracy of form — includes finish truing before final cut.

Automatic compensation for amount dressed off the wheels, and automatic wheel feed assure accurate sizing.



P.S. — Before the grinding operation, the foil contour is checked, the blade oriented and cast into a matrix, on a special J & L Optical Comparator. The matrix serves as a fixture for subsequent operations.

JONES & LAMSON

JONES & LAMSON MACHINE CO., 517 Clinton St., Dept. 710, Springfield, Vt., U.S.A.



*Machine Tool Craftsmen
Since 1835*

THREAD GRINDER DIVISION

"CINCINNATI"

shears 24 feet of 1/4 inch plate

...straight and true!

Cincinnati Shears, built with machine tool accuracy and exceptional rigidity, cut to close tolerances even on the longest cuts.

Built in lengths from 4 ft. to 24 ft., they shear .005" thick sheets to 1 1/4 in. plate with micrometer accuracy. They handle a wide variety of materials ranging from soft aluminum to armor plate.



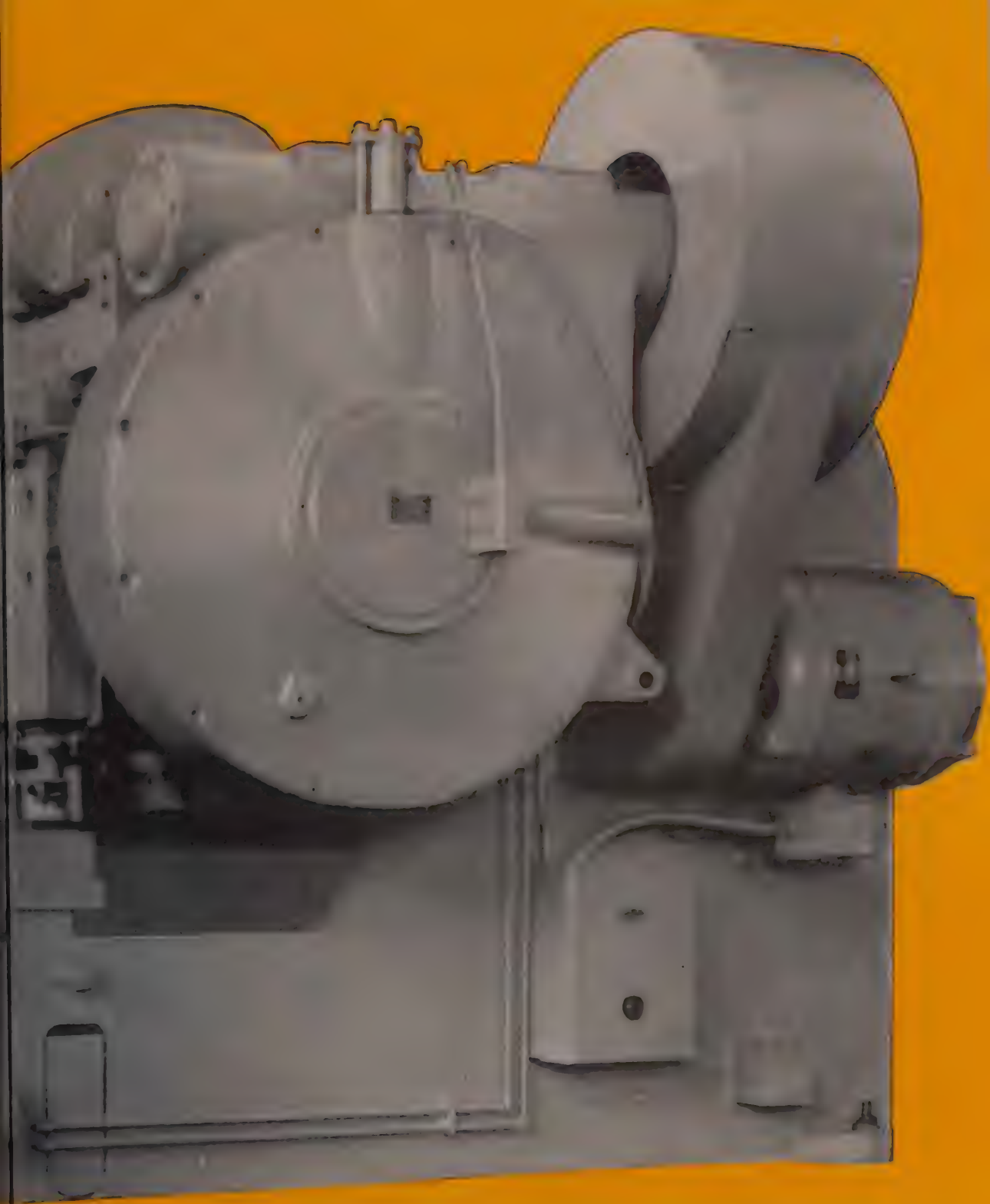
Write for complete shear catalog S-6.



THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES



■ Cincinnati 10024 Series Shear capacity $\frac{1}{4}$ in.
mild steel 24 ft. long.

"PYRODISC"

ONLY \$25!*

the new **LINDBERG** HOT PLATE

At last! A quality, portable hot plate . . . the Lindberg Pyrodisc!

It's built with the "occasional user" in mind. There's no point in buying the extra capacity of a larger hot plate if you don't need it. If your volume of "hot plate" work is limited, the Lindberg Pyrodisc is just what you want . . . and its selling price is only \$25.

These design, construction, and operating features make the Lindberg Pyrodisc Hot Plate an exceptional buy!

- Cast-in elements.
- "Stepless" control permits extremely precise control of temperatures.
- Terminals are protected from spillage and short circuits.
- Streamlined appearance . . . it's not just a good piece of equipment . . . it looks good, too!

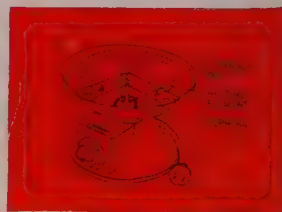
Diameter, top plate and base 8" • Power rating, 660 watts • Power service, 115 volts, 50/60 cycle • Includes cord and plug for easy installation • Approximate shipping weight, 10 lbs.

For additional information, ask for bulletin No. 1030

*Price subject to change without notice.



Sheathed Nichrome heating elements are cast into aluminum top plate . . . insuring quicker heating (750° F in 35 minutes), good uniformity, and exceptionally long element life.



SOLD ONLY THROUGH LABORATORY SUPPLY DEALERS

LINDBERG LABORATORY EQUIPMENT

Laboratory Division, Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois

For Big Business-SURE ...and Small Business, too!

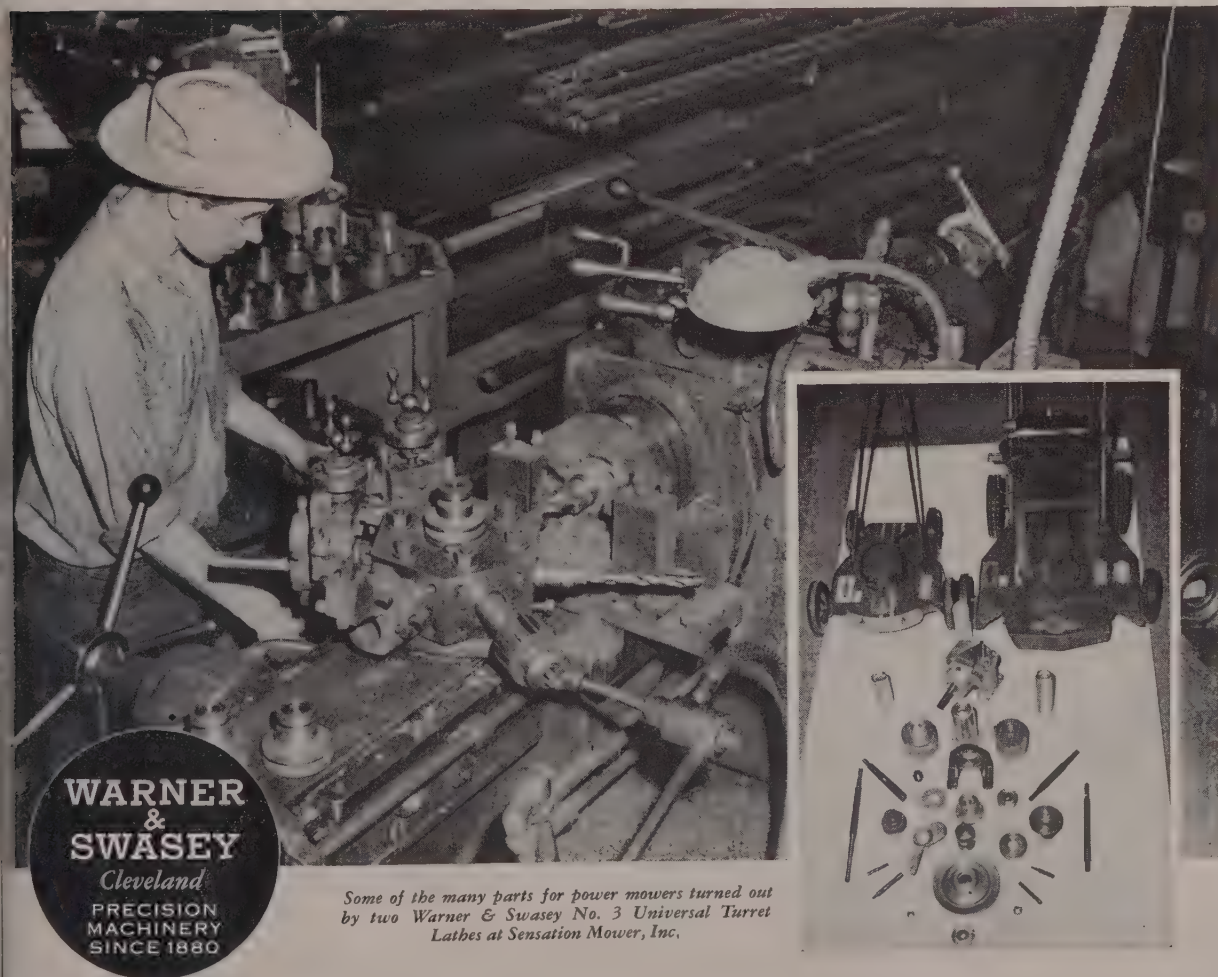
SENSATION MOWER, INC., Ralston, Neb., is not a high production shop in terms of metalworking plants. But this relatively young company, using only two Warner & Swasey No. 3 Universal Turret Lathes for their entire metal turning needs, was able to compete effectively and grow in the power lawn mower field.

The two Warner & Swaseys give Sensation Mower the versatility they need to produce over 40 different parts for mowers. They also turn out parts for newer lines of snow removal equipment

and power floor polishers. The Warner & Swaseys' versatility has even enabled the company to take on sub-contract work during their "off-season".

Both machines have had a total of *only one day's downtime* since their installation in 1946!

You can count on this kind of highly versatile, dependable production with Warner & Swasey Turret Lathes—money-makers whether you're a small manufacturer or in business in a "big" way!



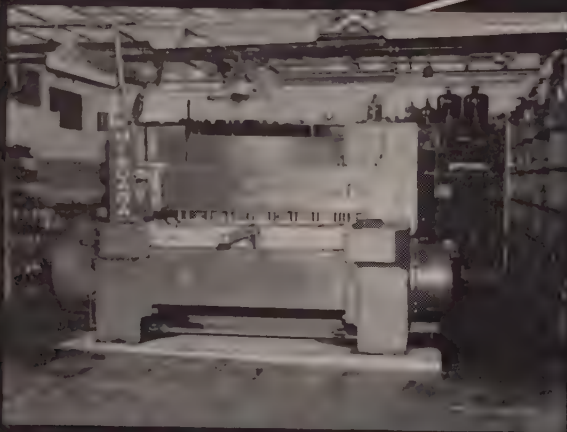
WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

Some of the many parts for power mowers turned out by two Warner & Swasey No. 3 Universal Turret Lathes at Sensation Mower, Inc.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

NIAGARA

SERVE INDUSTRY FROM



ELECTRONICS. Cutting .003" molybdenum to within .001" and $\frac{1}{4}$ " copper with no change in set-up at a plant in California



DRUMS. Shearing sheets for drum bodies in Texas

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

SHEARS

COAST TO COAST

* For high volume shearing applications, Niagara shears are preferred because of their:

**DEPENDABILITY /
ACCURACY
LOW MAINTENANCE COST**

A few typical installations are illustrated

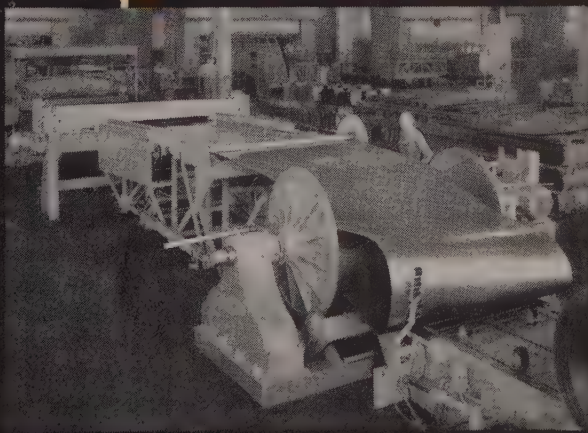
Niagara builds more than 80 different sizes and capacities of squaring shears... one to suit every requirement of production, maintenance or warehousing.



ELEVATORS. Two of seven Niagara Shears in production at a large plant in New Jersey



WAREHOUSE. Shearing thousands of tons of all kinds of steel at a steel warehouse in Michigan

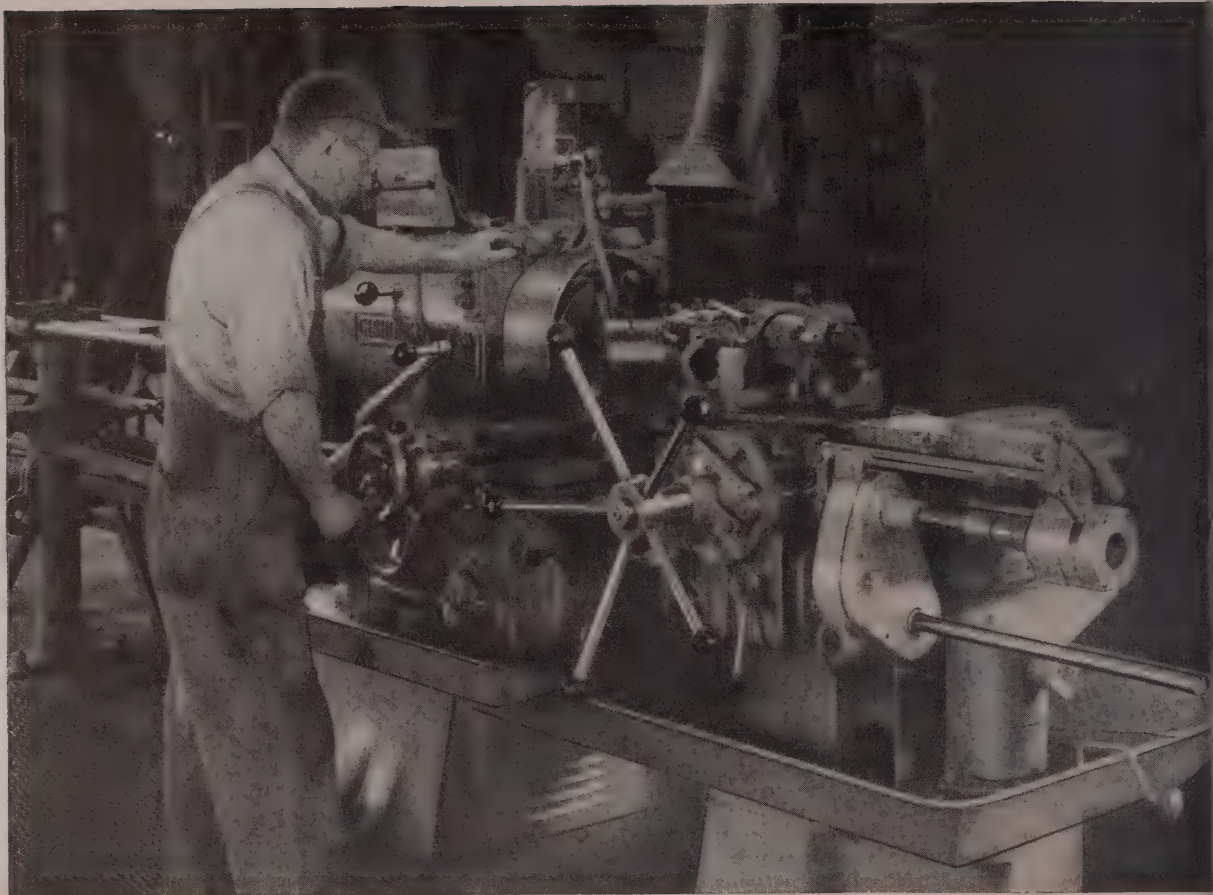


AUTOMOBILES. Continuous operation in a cut off line at a body plant in Western New York

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

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MACHINING FOR GOLD at Homestake



with Gisholt Turret Lathes

Yes, gold mining means machinery. And here at the famous Homestake Mine at Lead, South Dakota, Gisholt Turret Lathes help to machine the machines that dig for gold. It's a big job, too—turning out the variety of rock bits and drill rods that are used up in large numbers.

This Gisholt Ram Type Lathe was first used to turn the plain ends on the one-inch quarter-octagon drill steel for two types of rock bits. Production averaged 30 an hour. Now, the machine is also used to machine and thread three sizes of forged steel drill rods. Besides all this, the Gisholt has the job of facing and chamfering the chuck, or shank ends, of the drill steel so that a perfectly flat face is hit by the drill machine tappet.

Here, again, Gisholt Ram Type Turret

Lathes prove their easy change-over and ability to produce profitably, even on small runs—big assets in any machine shop. Ask your nearest Gisholt representative about them. Or write us.

GISHOLT

MACHINE COMPANY

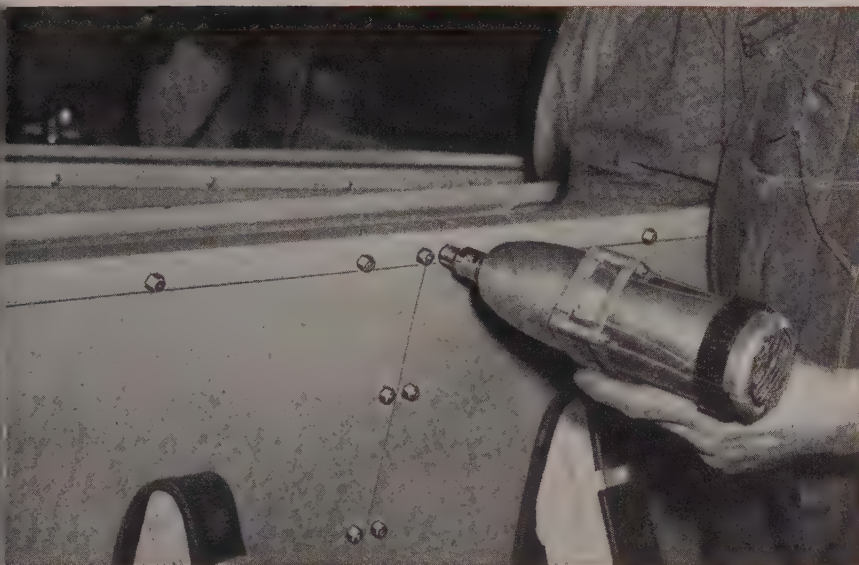
Madison 10, Wisconsin



THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

To cut assembly time



The one-piece, self-locking ELASTIC STOP nut is installed in seconds with an electric torque wrench. It will lock in any desired position on a bolt or stud—without extra parts or extra operations. Integral locking collars of nylon or fiber permit multiple re-use and re-setting.

and maintain adjustments



This Master Control mechanism on the Century Seeder must maintain a precise adjustment under conditions of severe vibration, in order to give a uniform seeding rate. ELASTIC STOP nuts maintain this accurate adjustment in spite of vibration, impact or stress reversal.



Century Engineering Corporation uses

Elastic Stop® nuts

H. H. McLeland, Chief Engineer for the Farm Equipment Division of the Century Engineering Corporation says:

"We specified Elastic Stop nuts on our new Century Seeder for all critical points because they withstood hundreds of hours of testing without losing their adjustment under vibration. They did not damage the

bolt or stud threads, and could be re-set many times.

"We specified the same nuts for non-critical points because they facilitated rapid assembly with an electric torque wrench, and eliminated a lock washer. These features saved many hours of assembly time per day."



**ELASTIC STOP NUT CORPORATION
OF AMERICA**



Dept. N43-960, Elastic Stop Nut Corporation of America
2330 Vauxhall Road, Union, N. J.

Please send the following free fastening information:

- ☐ Elastic Stop nut bulletin ☐ Here is a drawing of our product.
☐ Pointers on how to use them ☐ What fastener would you suggest?

Name _____ Title _____

Firm _____

Street _____

City _____ Zone _____ State _____

Mail coupon for design information

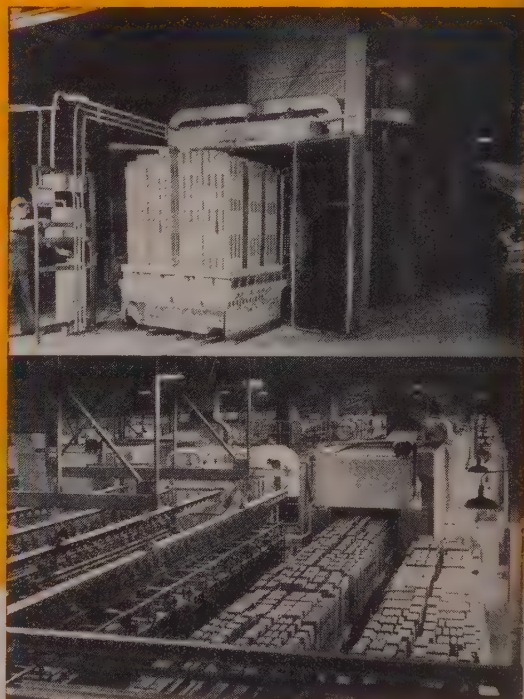
HARBISON-WALKER

the world's largest producer of



**COMPLETELY NEW PLANTS
AND EXPANDED FACILITIES IN OTHER PLANTS
ADD TO HARBISON-WALKER'S SILICA BRICK CAPACITY**

Silica refractories are made in Harbison-Walker plants in Pennsylvania, Ohio, Alabama, Indiana, Texas and California. The illustrations show the modern tunnel kilns in which STAR and VEGA are fired. Throughout all mining, processing, forming, drying and firing operations, modern methods and equipment are used to insure the uniformity and high quality of Harbison-Walker silica refractories.





Super Duty

SILICA BRICK

meets the greater demand
with increased production facilities!

Over the years, the use of Harbison-Walker STAR and VEGA brands has steadily increased. For more than half a century, STAR has been the standard of quality for silica refractories. Continued research, developments in every step of the manufacturing procedures and close laboratory control, all contribute to the uniform high quality of STAR and VEGA.

VEGA brand, the original super-duty silica brick, first introduced over a decade ago was developed to meet the need for a silica refractory which provides the margin of refractoriness for the operation of furnaces at higher temperatures. Used under normal operating conditions, VEGA gives longer life and reduces maintenance costs.

Harbison-Walker continues its leadership of the progress in the production of silica refractories. To meet the greater demand for STAR and VEGA, Harbison-Walker has recently completed an extensive expansion program which has greatly added to the capacity for producing these refractories.

HARBISON-WALKER REFRACTORIES COMPANY

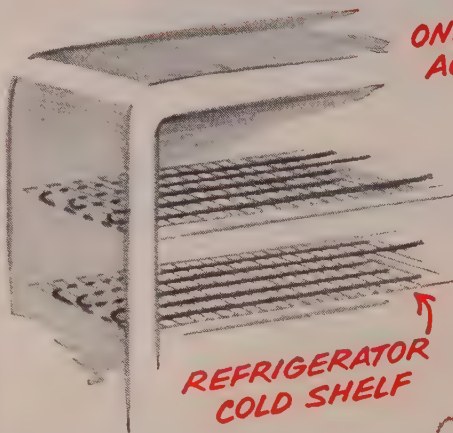
AND SUBSIDIARIES

World's Largest Producer of Refractories

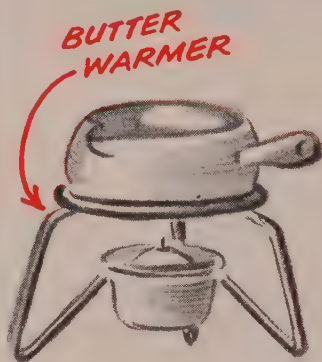
General Offices: Pittsburgh 22, Pennsylvania

FROM
TO

the Bundy Sketchbook
jog a designer's imagination

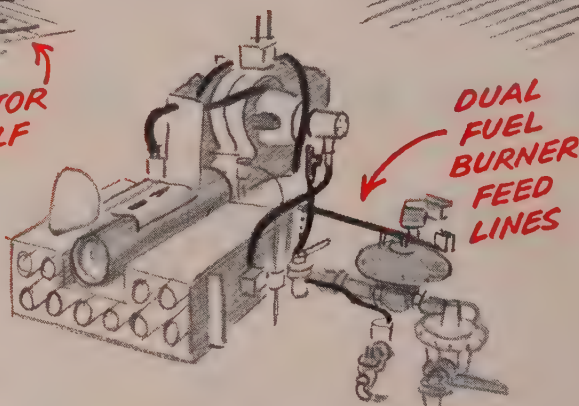


REFRIGERATOR
COLD SHELF



BUTTER
WARMER

ONE PIECE AUTO
ACCELERATOR
ROD



DUAL
FUEL
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LINES

REMARKS Give your ideas a cost-saving twist -- with Bundyweld Tubing. The very standard of dependability, it's helped beat many design, fabrication problems. Add: Bundy's unmatched fabricating, specialized engineering.

WRITE → today for Bundyweld catalog or for help in developing your tubing application ideas.

BUNDY TUBING COMPANY, DETROIT 14, MICH.

Bundyweld Tubing

® DOUBLE-WALLED FROM A SINGLE STRIP

WHY BUNDYWELD IS BETTER TUBING



Bundyweld starts as a single strip of copper-coated steel. Then it's . . .



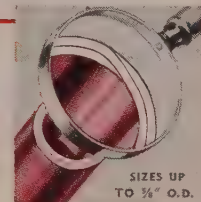
continuously rolled twice around laterally into a tube of uniform thickness, and passed through a furnace. Copper coating fuses with steel. Result . . .



Bundyweld, double-walled and brazed through 360° of wall contact.



SIZES UP TO 3/4" O.D.



SIZES UP TO 3/4" O.D.

NOTE the exclusive patented Bundyweld beveled edges, which afford a smoother joint, absence of bead and less chance for any leakage.

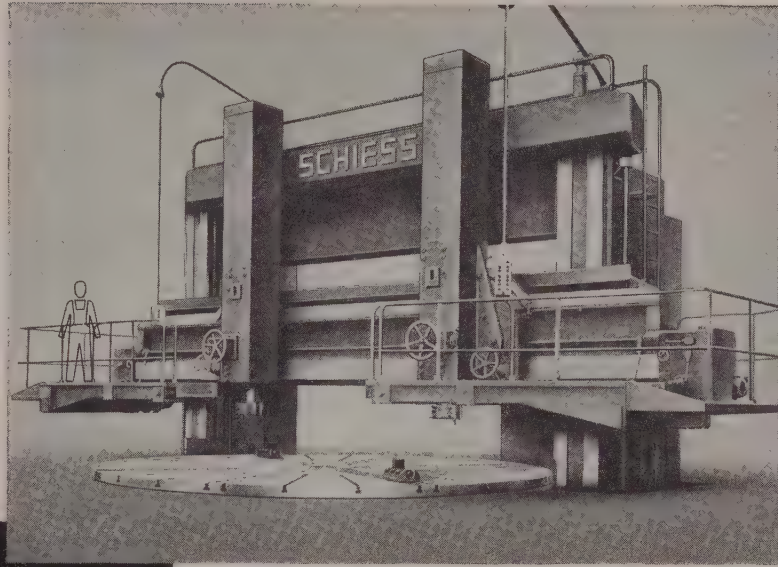
Bundy Tubing Distributors and Representatives: Cambridge 42, Mass.: Austin-Hastings Co., Inc., 226 Binney St. • Chattanooga 2, Tenn.: Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • Chicago 32, Ill.: Lopham-Hickey Co., 3333 W. 47th Place • Elizabeth, New Jersey: A. B. Murray Co., Inc., Post Office Box 476 • Philadelphia 3, Penn.: Rutan & Co., 1717 Sansom St. • San Francisco 10, Calif.: Pacific Metals Co., Ltd., 3100 19th St. • Seattle 4, Wash.: Eagle Metals Co., 4755 First Ave. South Toronto 5, Ontario, Canada: Alloy Metal Sales, Ltd., 181 Fleet St., E. • Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.



See SCHIESS equipment on display at
AMERICAN SCHIESS SERVICE CENTER
38th Street & AVRR • Pittsburgh, Pa.

By combining basic Schiess elements, extra heavy machines that would normally be considered special tools, can be built to your work diameter and load requirements.

The equipment shown here is typical of unusually large boring mills of latest Schiess design which, like the smaller models, incorporate new operating features listed below.



Model 3K Vertical Boring Mill
with 15 ft. turning diameter

NEWLY DESIGNED

HUGE VERTICAL BORING & TURNING MILLS *like these -*

Built from basic Schiess designs to any diameter from 10 ft. to 84 ft.

Model 5K Vertical Boring Mill
with 22 ft. turning diameter

Fingertip Speed Control

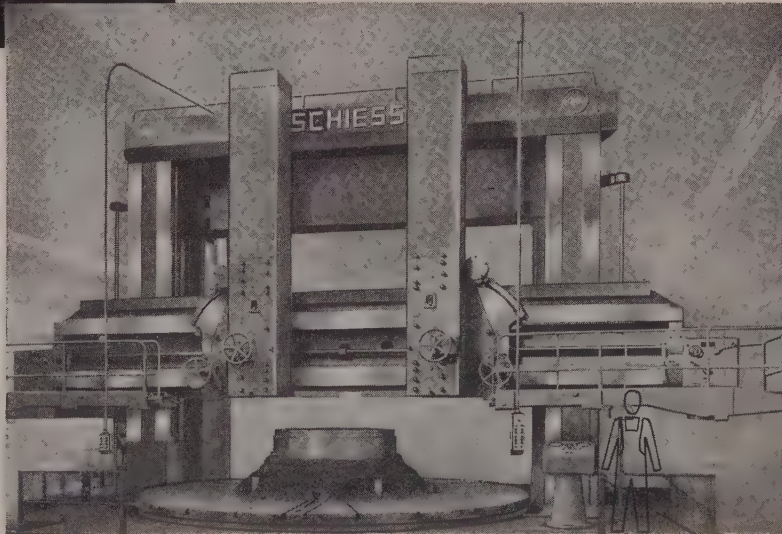
Counterbalanced cross rail and side head

Octagon rams which can be swiveled, completely enclosed

Pendant Control

Automatic Lubrication

Vertical Boring Mills of this type can be equipped with inner and outer tables—and with 1 or 2 operator control panels.



Engineering Division

AMERICAN

SCHIESS
CORPORATION

38th Street and AVRR, Pittsburgh, Pennsylvania

Sole Distributor



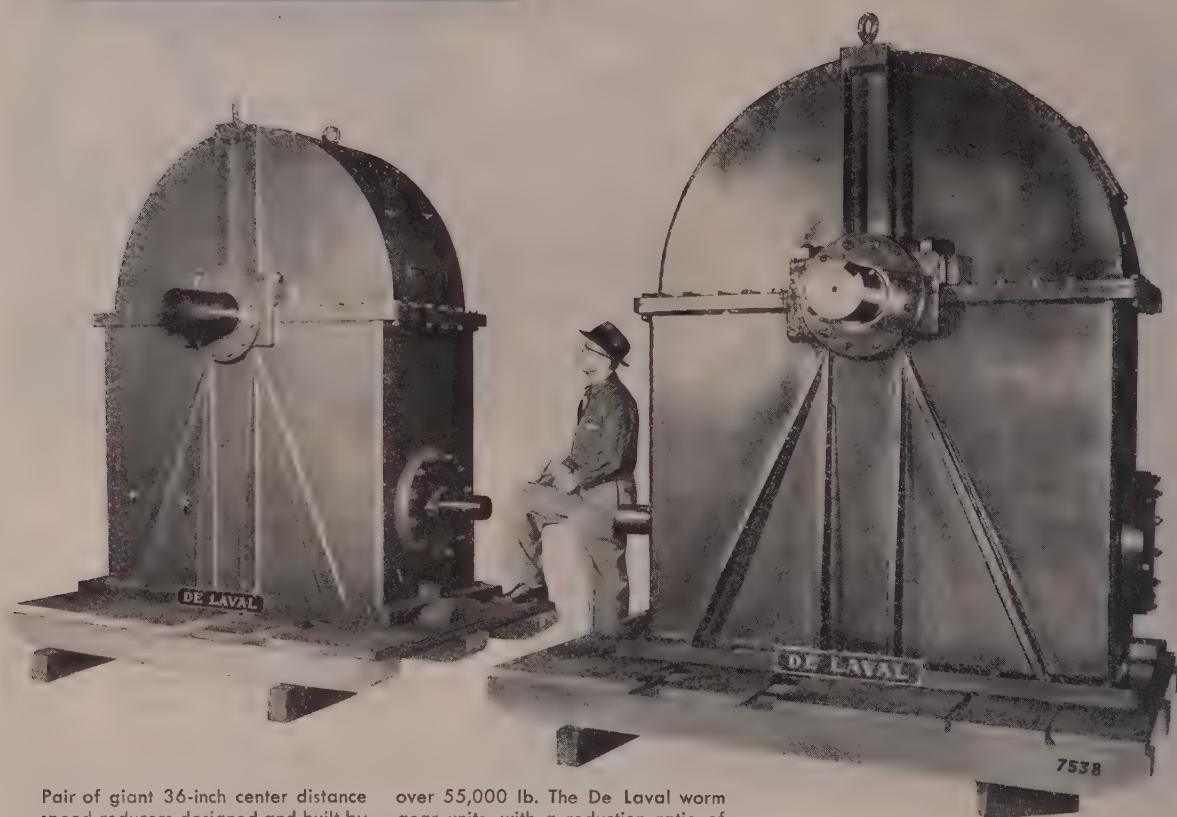
KURT ORBAN
COMPANY, INC.

205 East 42nd St., New York 17 • 1256 East 12th St., Cleveland 14
18627 James Couzens Highway, Detroit 35 • 1939 Santa Fe Ave., Los Angeles

DE LAVAL

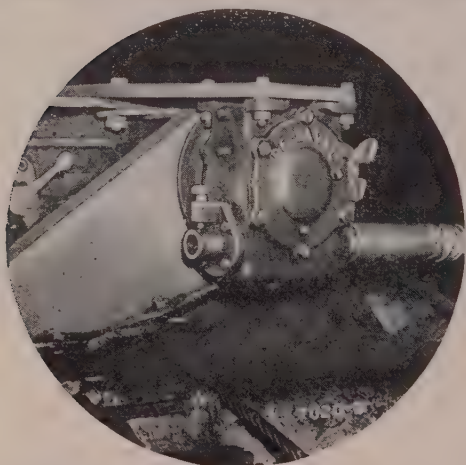
SPEED REDUCERS

from dwarf to giant size



Pair of giant 36-inch center distance speed reducers designed and built by De Laval for slab transfers in a slabbing-blooming mill. These slab transfers are used to convey steel slabs up to 12 in. thick and 42 in. wide, weighing

over 55,000 lb. The De Laval worm gear units, with a reduction ratio of $26\frac{2}{3}$ to 1 in a single set of gearing, are each driven by a 200 hp, 410 rpm motor coupled directly to the input shafts of the slab transfers.



Here's one of the smaller De Laval worm gear speed reducers with a 3" center distance being used for a new coal drilling machine.

De Laval heavy-duty worm gear speed reducers seldom require attention under the most rugged operating conditions. They make a quiet, close-couple compact drive. They permit high ratio reductions in a minimum of space and withstand severe shock loads without damage. De Laval builds all sizes from 3" to 36" center distances for transmission ratios of 3.1:1 to 100:1 in single reduction units and ratios of 50:1 to 8000:1 in double reduction units. Whether you need dwarf or giant worm gearing, consult De Laval for engineering assistance. Send for *De Laval Manuals G-WBV and G-WWH* containing data on single and double reduction units.



DE LAVAL Speed Reducers

DE LAVAL STEAM TURBINE COMPANY

860 Nottingham Way, Trenton 2, New Jersey

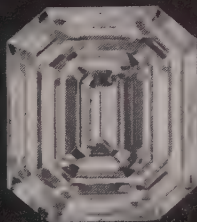
DL210



Here is perfection!


ROEBLING high carbon wire is unsurpassed for industry today. Roebing wire is absolutely true to specifications ...absolutely uniform in gauge and finish. Manufacturers who try Roebing wire once, become Roebing customers from then on.

You *pay* for the best when you buy high carbon wire. Make sure that you *get* it! Always specify Roebing. John A. Roebing's Sons Corporation, Trenton 2, N. J.



The Jonker, world's largest emerald-cut diamond.



ROEBLING 

A subsidiary of The Colorado Fuel and Iron Corporation

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Gives white hot steel the "kid glove" treatment



GIGANTIC MACHINES with thousands of moving parts are used to shape white hot ingots into plates and sheets. All of these hard-working machine parts are subject to intense heat . . . normal in steel manufacturing. Because of the intense heat, lubrication is a serious problem.

U. S. Steel has tried various types of greases in order to eliminate the problem of oil burn-out. Now they're using a product of Shell Research, Shell Alvania Grease. Result: better lubricating action *at once*. Months after the original installations, rollers were removed and an excellent film of grease was still present.

At the other extreme, zero weather caused grease in an automatic lubricating system to congeal and

become unpumpable. Shell Alvania was tried and clogging promptly stopped. This multi-purpose grease is now used extensively in low-temperature operations at U. S. Steel's Ohio Plant.

SHELL ALVANIA GREASE



- resists oxidation
- will not squeeze out
- extends periods between overhauls
- provides exceptional lubrication in high or low operating temperatures.

Shell Alvania Grease can cut down costly maintenance and save time and money in *your* plant. Write for technical information.

SHELL OIL COMPANY

50 WEST 50TH STREET
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100 BUSH STREET
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the same everywhere...
and so is REX HIGH SPEED STEEL

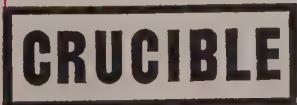
- Rex® High Speed Steels
- Peerless Hot Work Steels
- Halcomb 218
- Chro-Mow®
- Sanderson Carbon Tool Steels
- Ketos®
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- Airdi® 150
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- CSM 2 Mold Steel
- La Belle® Silicon #2
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**SPECIFY
 YOUR TOOL STEELS
 BY
 THESE
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Great pains are taken to ensure that all Crucible REX High Speed Steels are uniform. Every scientific test known is used to make certain that all materials conform exactly to Crucible's high standard of quality. And only *Crucible* makes REX High Speed Steels.

REX High Speed Steels are readily available in all parts of the country...through the widest distribution system maintained for tool and other special purpose steels. For uniformity and dependable delivery, call your nearest Crucible warehouse.

WRITE TODAY for the unique Crucible Tool Steel Selector, 9" diameter, in 3 colors — a twist of the dial tells you which tool steel is best for your application. Address your request to Crucible Steel Company of America, Dept. S, Oliver Building, Pittsburgh 22, Pa.



first name in special purpose steels

53 years of *Fine* steelmaking **TOOL STEELS**

CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N. Y.

Need special-purpose wire or steel?

WHETHER it's manufacturing special wire and steel to your specifications, or working with your engineers to develop new types to solve new problems, you can always count on National-Standard for something extra . . . in quality control . . . in product uniformity . . . and in service! Not just an idle boast. We've been doing it that way for 47 years . . . and would like mighty well to prove it to you.

Check these N-S products

NATIONAL-STANDARD DIVISION

Niles, Michigan
Phone: 1700

Stainless Steel Wire002" to .065" Diameter
Stainless Steel Flat Wire010" to .040" Thickness
Width .020" to .090" x .015" to .067" Diameter
Music Spring Wire002" to .054" Diameter
High Carbon Steel Wire Minimum Rope Diameter .008"
Fine Wire Rope Maximum Rope Diameter .048"
Up to 1" Wide
Braided Wire—Flat Up to 18" Diameter
Braided Wire—Tubular

WORCESTER WIRE DIVISION

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Phone: 2-2871

Fine Wire: Diameter .002" to .075"
Stainless
High Carbon
Low Carbon
Monel
Galvanized
Tinned
Cadmium Plated
Beryllium Copper
Music Spring Wire: Diameter .002" to .250"
Flat Wire: Maximum .125" Wide
Maximum .060" Thick

ATHENIA STEEL DIVISION

Clifton, New Jersey
Phone: Prescott 9-1881

Tempered or Untempered Flat
High Carbon Strip and Flat Wire—
Blue, Straw or Bright
Width: Maximum 6 1/2" Wide
Minimum015" Wide
Thickness: Maximum060" Thick
Minimum001" Thick
Above Range for Either Regular
Spring Steel or Specialty Steels
Stainless: Hard Rolled
Maximum Width375"
Maximum Thickness025"
Egloy: Maximum Width 1"
Maximum Thickness025"

REYNOLDS WIRE DIVISION

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Wire Cloth
Carbon and Stainless Steel—Non-Ferrous—Copper Clad
Plain Weave Up to 120 Mesh
Twill Weave Up to 150 Mesh
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Electro and Hot Dip Galvanized, Tinned—Before Weaving

ATHENIA STEEL..Clifton, N. J.....Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD..Niles, Mich.....Tire Wire, Stainless, Fabricated Braids and Tape
REYNOLDS WIRE..Dixon, Illinois.....Industrial Wire Cloth
WAGNER LITHO MACHINERY..Jersey City, N. J.....Metal Decorating Equipment
WORCESTER WIRE WORKS..Worcester, Mass.....Round and Shaped Steel Wire, Small Sizes



DIVISIONS OF NATIONAL-STANDARD CO.
NILES, MICHIGAN



"Best Wheel Ever Used," reported by a user of Norton G Bond wheels for cylindrical grinding, sums up the industry-wide verdict.



"G Bond Wheels Cut Faster, with twice as many pieces per dressing," says a customer reporting on a centerless grinding application.

**PROOF that
O.D. grinding
gets the
"TOUCH
of GOLD"
with Norton
G BOND wheels**

... "Free cutting, excellent finish, considerably reduced grinding time."

... "Gave more than three times as many pieces per dressing."

... "Formed easily, held shape and removed .078" per plunge cut."

Reports like these are coming in fast from our O. D. grinding customers using the new Norton G Bond wheels — now chalking up sensational records for more units per dressing, per hour and per wheel.

That's because of the new G Bond's unique ability to hold each abrasive grain *just long enough* for maximum cutting action. Wheels made with it cut cooler ... remove material faster ... produce a better finish ... produce more pieces per dressing ... hold shape longer ... and crush-true more easily.

Ask Your Norton Distributor to prove how G Bond wheels will add this production-boosting, cost-reducing "Touch of Gold" to every cylindrical or centerless grinding job you do. He'll gladly arrange a test in your plant. Or write to **NORTON COMPANY**, Worcester 6, Mass. Distributors in all principal cities — listed under "Grinding Wheels" in your telephone directory yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

W-1511



***Making better products ...
to make other products better***

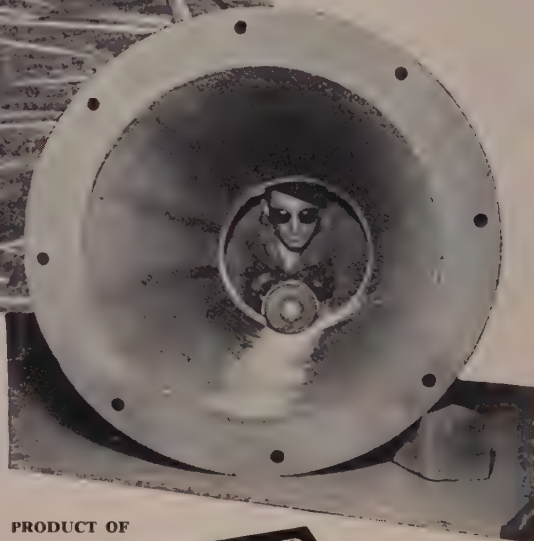
What U. S. Rubber means by "job-g geared" grinding wheels...



(Below) Grinding a weld in a section of a new air duct for a steel mill, using a U.S. Royalite straight side wheel.

They mean just this. From United States Rubber Company's wide selection of grinding wheels, "U.S." technicians recommend only a wheel that is exactly *geared* to the job. If there's no such wheel, they'll design one.

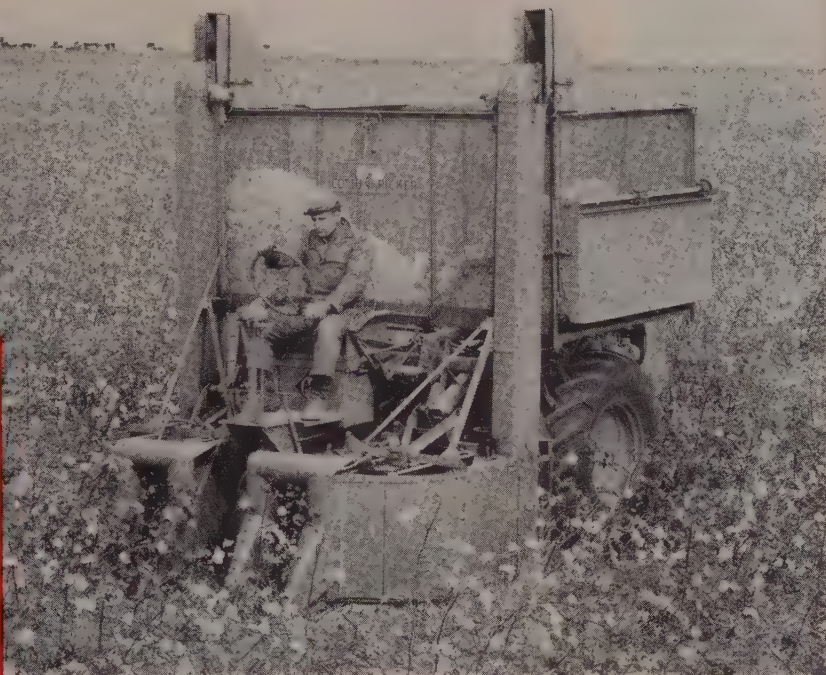
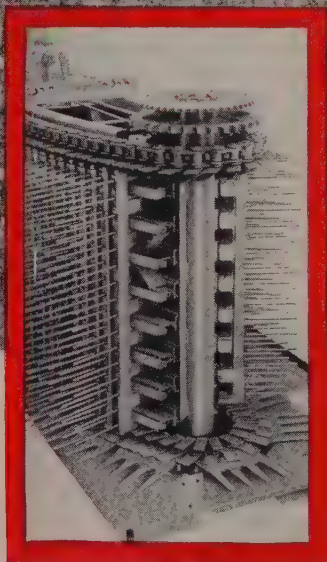
Take the special U.S. Royalite® Cup Wheel shown in action above. It's grinding smooth the steel table top for a large industrial saw. This wheel must have just the right degree of softness to finish the already semi-smooth surface. Because it's "job-g geared", it works perfectly. Next time you need the right wheel, write to the address below.



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HEAT TREATING MAKES STRONG FINGERS FOR COTTON PICKERS

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In the southland there's something new on the horizon . . . a mechanical cotton picker. It's quite a machine . . . picks two rows at once . . . handles acres and acres of cotton in nothing flat compared to slow, laborious hand-picking.

It's intriguing to watch this amazing machine. It has 2,560 *rotating steel fingers* that gently probe the open cotton bolls, and deftly pick out the soft, white cotton fibres.

A few years back when the new cotton picker was in the design and testing stage, the carbon steel fingers . . . all 2,560 of them came up for some serious attention. The heat treating *had* to be right. For the "fingers" had to be straight and they had to be hard. Just the right hardness . . . not *too* hard or they might snap off, and not too soft or they might bend.

Allis-Chalmers brought their problem to the metallurgical and heat treating research laboratories of Lindberg Steel Treating Co. In a short time, Lindberg heat treating specialists, in cooperation with Allis-Chalmers engineers, developed an effective and successful process. It permitted the heat treating of the carbon steel fingers without scaling . . . and without distortion . . . to precisely the right physical properties.

Solving problems in heat treating is an everyday experience for Lindberg Steel Treating Company. Some 34 metallurgical engineers and metallurgists with a composite heat treating experience of more than 650 years are available to consult with you on any heat treating problem. Your inquiry is invited.

A case history of Lindberg Steel Treating Co. service to American industry



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Grefco's OLIVE HILL brick has proved its ability to pour out production through longer campaigns . . . has long been a favorite with steel men in blast furnace application.



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In the open hearth, Grefco's silica, RITEX chrome-magnesite basic brick . . . and STEELKLAD, Grefco's patented basic brick encased in a permanent steel shell have contributed *much* to modern steel production.

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ROUGH silica brick, STEELKLAD and RITEX are superior refractories for lining soaking pits. From coast to coast and border to border, wherever there is a steel mill and soaking pit, chances are you'll find Grefco dependably on the job.

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Even the railroad cars in which the plate, sheet, strip or wire are shipped would not exist but for Grefco's truly *complete refractories service*. Call on Grefco yourself!



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This unsurpassed volume stability of Permanente 84 means fewer repairs are needed between heats. And faster repairs are possible because it's easy to use.

Act now! Start using Permanente 84 for open hearth and electric steel furnace rebuilds as well as for bottom, bank and tap hole maintenance. Let Permanente 84 help increase *your* production—and reduce your material costs through superior performance.

SEND FOR BOOKLET giving all the important advantages of Permanente 84 and the companion material, Permanente 165. Upon request, your Kaiser refractory engineer will promptly offer you research, design and installation service to help you obtain more steel tonnage per year, at lower bottom cost per ton. Call or write principal sales offices: Chemical Division, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California. First National Tower, Akron 8, Ohio.



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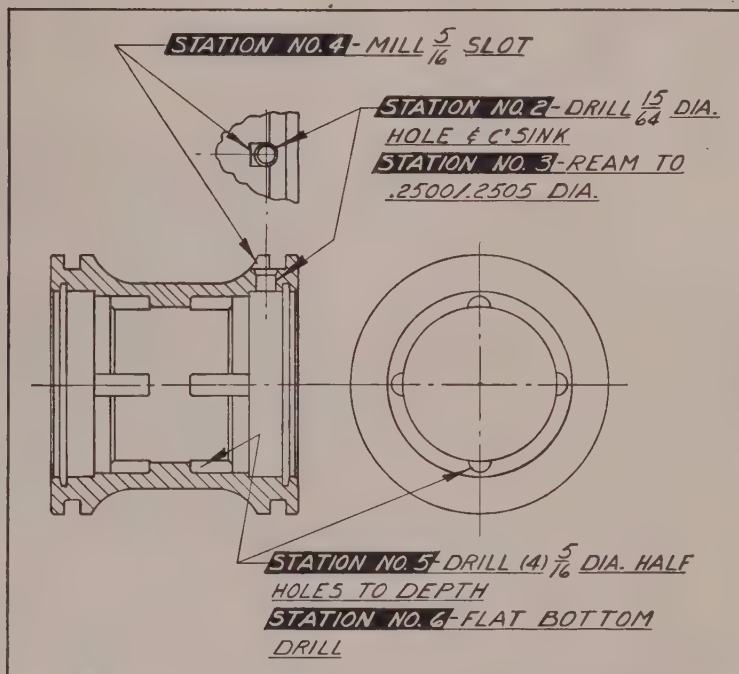
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Special automatic indexing-type machine drills, reams, mills and countersinks 440 steering gear pistons per hour at 100% efficiency!

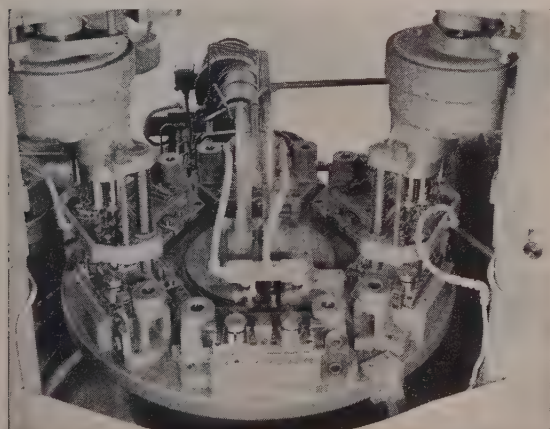


Turner's specially designed fixtures and multiple spindle heads account for the exceptional efficiency of this time-saving machine operation. An unusual feature of this particular fixture and clamping mechanism is the dead center indexing table mounting a stationary cam track. Rollers, attached to the fixture clamping mechanism, pass through as the table indexes. Limit switches, also attached to the center, make it impossible for the machine to operate unless the parts are clamped in place. In the close-up, at left, you will notice that the multiple spindle drill heads have guide pins which enter bushings in the fixture before the actual machining operation takes place. This insures extreme machining accuracy.



The sequence of operations is as follows:

- Station 1: Operator places part in the RH side of the fixture and the machine indexes to Station 2.
 - Station 2: (Four) $\frac{5}{16}$ " port holes are drilled to depth. At the same time, the next fixture has come into position at Station 1 and the loading operation is repeated. The first fixture moves to Station 3 and the (Four) $\frac{5}{32}$ " radius port holes are flat bottom drilled.
 - Station 4: The $\frac{5}{16}$ " slot is milled.
 - Station 5: The $\frac{5}{16}$ " hole is drilled and countersunk.
 - Station 6: The $\frac{5}{16}$ " hole is reamed to .2500/.2505".
- The fixture is then indexed to starting Station 1 where the part is automatically unclamped, removed from the RH side of the fixture and placed end for end on the LH side of the fixture. At the same time, the new part is loaded onto the RH side of the fixture as in the first cycle of the machine. From this point on, the machine cycle is the same as previously described and for each complete cycle of the machine, the part will be completely machined as per the above operations.



Turner solves high production problems such as this by first studying the problem thoroughly, applying years of technical experience; then, by designing fixtures and spindle heads *exactly suited to your job*. With all Turner special purpose machines, standard bases and columns are used to keep manufacturing costs down. It means you are assured a machine specially designed for your application, yet without the high extra costs you might expect. Drop us a line; we'll be happy to look over your particular production problem.

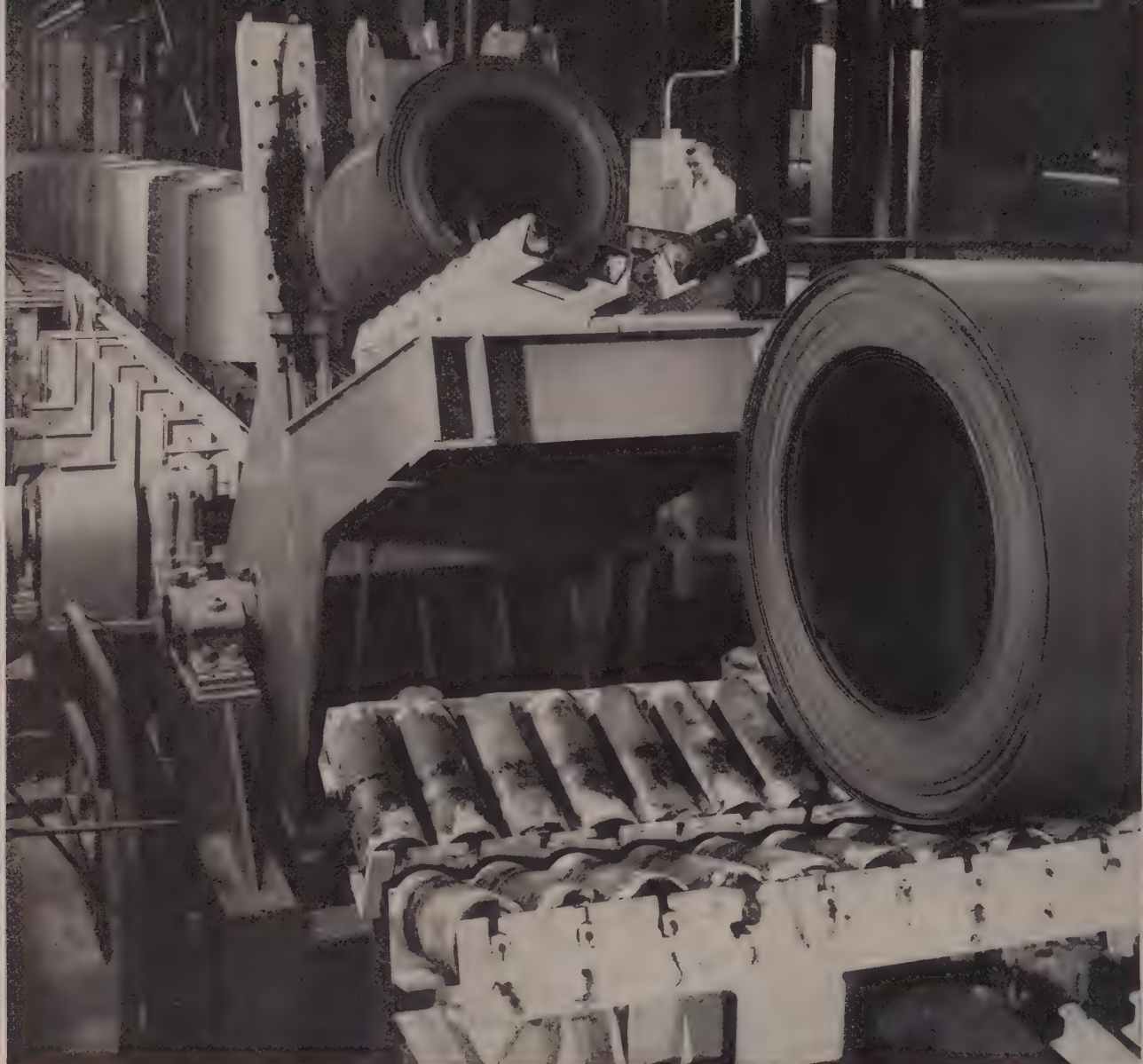
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By knowing in advance what and how you manufacture . . .

Pittsburgh Steel custom builds sheet steel to meet your production line requirements

Metallurgists start each sheet order with selection of correct raw materials, then control each process from blast furnace to proper packaging for shipment to customer.

Manufacturers of automobiles, household appliances, construction machinery, building materials, and the hundreds of other useful products made from steel sheets must meet keen competition . . . they must be able to turn out quality products at the lowest possible prices and make a reasonable profit.

Pittsburgh Steel wants to be sure its customers get a better than even start. To do this, it has adopted a policy of custom building its sheet steel to meet your production requirements, making certain the sheet you order will meet specifications.

Here's how alert men in the metallurgical department have been able to

hit top-quality hot rolled sheets right from the start. First, they have a brand new mill, the newest and most modern of its type in the country. They also have the latest gauges, controls and testing apparatus for assuring quality.

They have another working tool—one that can't be bought and installed



Analyzing for Carbon—Bill McShane, Assistant Chief Chemist, holds steel chips the size of finely ground coffee. He is showing them to Combustion Chemist, Charles Keznor, who will weigh and put them into the electric carbon combustion furnace at right, where chips are burned in a stream of oxygen. The carbon dioxide formed is absorbed into a bulb. It is then weighed and the amount of carbon in the steel calculated accurately.



Studying Internal Quality—Highly polished samples of steel strip mounted in plastic are examined on this inverted metallurgical microscope. Shown above, George Chapman, supervisor of the metallurgical lab, is preparing to inspect the grain structure of the steel. Lack of foreign elements in the steel indicates that it is clean steel.

like a machine—which is the most important of all. It is the human element, the willingness, the desire of every man along the line from raw materials to shipping room to cooperate with each other to turn out the best, the best-quality flat rolled steel that has yet been rolled.

Pittsburgh Steel's metallurgists believe in close cooperation—not only with the men they work with, but the men they work for—the customers. That's why they prefer to visit a customer's plant before the sheet order is entered. They observe manufacturing processes, see how sheets are being shaped, study blueprints, get all the information necessary in order to determine their recommendations for the best chemical analysis of steel, the correct internal structure, surface finish, what size sheets will work best.

When specifications are approved by the customer, the next step is to assemble the best grades of raw materials—the iron ore, coke, and limestone, then start at the blast furnaces. Through iron making, steel making, pouring ingots, rolling ingots into slabs, rolling slabs into hot rolled sheets—every operation and every process, Pittsburgh Steel metallurgists are on the job day and night around the clock making sure the order is being filled correctly.

What about results? Reports from customers indicate the metallurgists are hitting the mark. Thousands of tons of Pittsburgh Steel's sheet are "proving out" with highly satisfactory performance on scores of production lines.

If you use steel sheets in the manufacture of your products and you have a problem, why not talk to a man from Pittsburgh Steel?



Testing for Physicals—Metallurgist, Ben Labeka, checks the finished steel for physical qualities. Here he is, shown above, testing with an Olsen ductility tester, to check the steel for ductility and ease of forming for fabrication. Ben, one of the metallurgists who has helped set up the specifications of the steel after examining customers' blueprints and studying their fabricating methods, now knows that this steel will meet all requirements of the customer.



Where Coils Become Sheets—The hot shear line, built for continuous line processing of hot rolled steel, converts coils into individual high-quality sheets. A processor loosens any mill scale. A side trimmer trims the steel to exact width specification. A flying shear cuts the steel to lengths of 3 feet to 30 feet. The steel passes through two sets of levelling rolls to assure accurate flatness. Sheets are inspected and defective sheets rejected. Prime sheets are stacked at end of the line, weighed and banded for shipment.

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ELECTROMET *Data Sheet*

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

Why 3 Per Cent Chrome Steel Makes Good Castings for Wear Resistance

Castings of 3 per cent chromium steel have been used in substantial tonnages, for many years, for various equipment parts demanding good wear resistance. Such castings offer an excellent combination of hardness and toughness. Typical applications are crusher parts used in rock- and ore-crushing equipment, swing hammers for pulverizing coal, railroad switch frogs, gears, pulleys, sheaves, and other castings that must meet severe conditions of wear.



Fig. 1. Railroad switch frogs, which are subject to severe wear, give outstanding service when cast of 3 per cent chromium steel.

The 3 per cent chromium steels, are normally produced in a carbon range of 0.30 to 0.50 per cent. They exhibit excellent depth-hardening properties, which simplify heat-treatment and insure uniformity throughout heavy sections. The analysis is usually modified by a molybdenum addition, since this element aids in increasing hardenability.

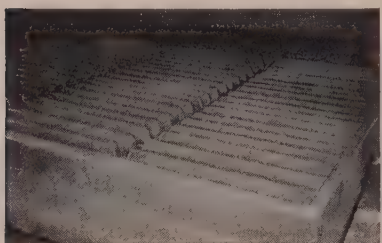


Fig. 2. Grating for top of shake-out machine is cast of 3 per cent chromium steel to give good wear resistance and long life.

Properties Improved by Heat-Treatment

The best properties of 3 per cent chromium steels are developed through heat-treatment. Generally, this consists of a normalizing treatment from 1650 deg. F., followed by tempering in a range between 1000 and 1250 deg. F., depending on the physical properties desired. Double normalizing is sometimes used to obtain further improvement in the grain structure. With carbon on the high side of the specification, air-quenched castings show a Brinell hardness number of over 400 in 3-inch sections. This hardness is practically uniform throughout the section. Oil quenching is employed to produce higher hardness and depth of penetration, and even in a 4-inch section, a hardness number of over 500 Brinell is obtained.

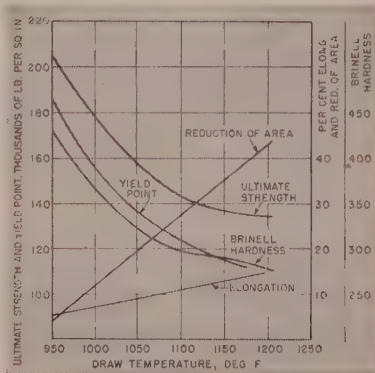


Fig. 3. These curves show the response to tempering of a 0.37 per cent carbon, 2.93 per cent chromium, 0.35 per cent molybdenum steel previously normalized from 1650 deg. F.

The steel also shows good response to tempering. After a normalize and a 1100 deg. F. treatment, it has a tensile strength close to 150,000 pounds per square inch, with an elongation value of about 12 per cent, and a Brinell hardness of about 300. When greater ductility is required, tempering should be done at

higher temperatures. However, in such instances, some strength and hardness are sacrificed.

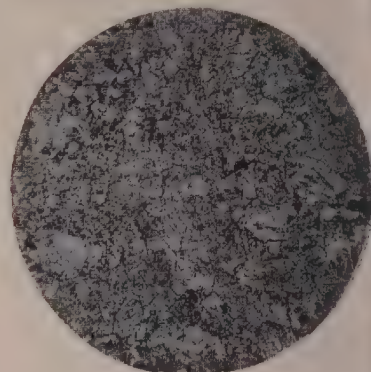


Fig. 4. Photomicrograph of 3 per cent chromium steel normalized from 1650 deg. F. and tempered at 100 deg. F. (X250). The pseudo-martensitic structure is well suited to resist abrasion.

Effect of Other Alloy Additions

Molybdenum in the range from 0.30 to 0.50 per cent will improve depth-hardening characteristics and aid in reducing susceptibility to temper brittleness in the lower temperature ranges. If the molybdenum-bearing steel contains relatively high carbon (0.40 to 0.60 per cent) additions of approximately 0.08 to 0.10 per cent vanadium provide greater uniformity in hardening. Small additions of silicon increase strength and hardness and this element is sometimes increased to 0.80 or 1.00 per cent. Manganese is added in amounts between 0.50 and 0.80 per cent.

Metallurgical Service Available

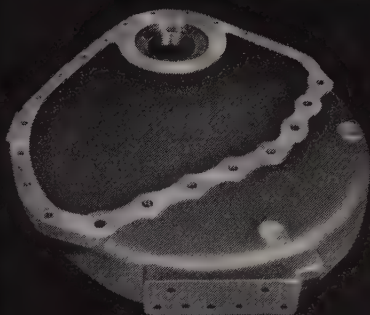
When you have occasion to produce castings for applications involving severe abrasion and wear, it will pay you to investigate the advantages of using 3 per cent chromium steel. If you need help on some specific metallurgical problem, be sure to consult one of ELECTROMET's specially trained metallurgists and engineers. For further information, write to the nearest ELECTROMET office: in Birmingham, Chicago, Cleveland, Detroit, Los Angeles, New York, Pittsburgh, or San Francisco. In Canada: Welland, Ontario.

The term "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.

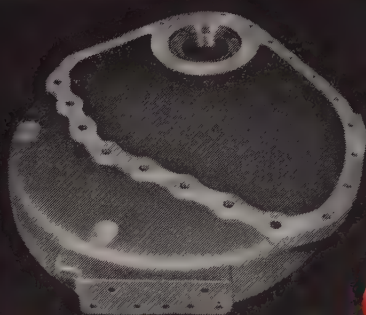


HOLETAPPER and DRILLER

DRILLS AND TAPS EITHER
RIGHT HAND OR LEFT HAND TANK CASES

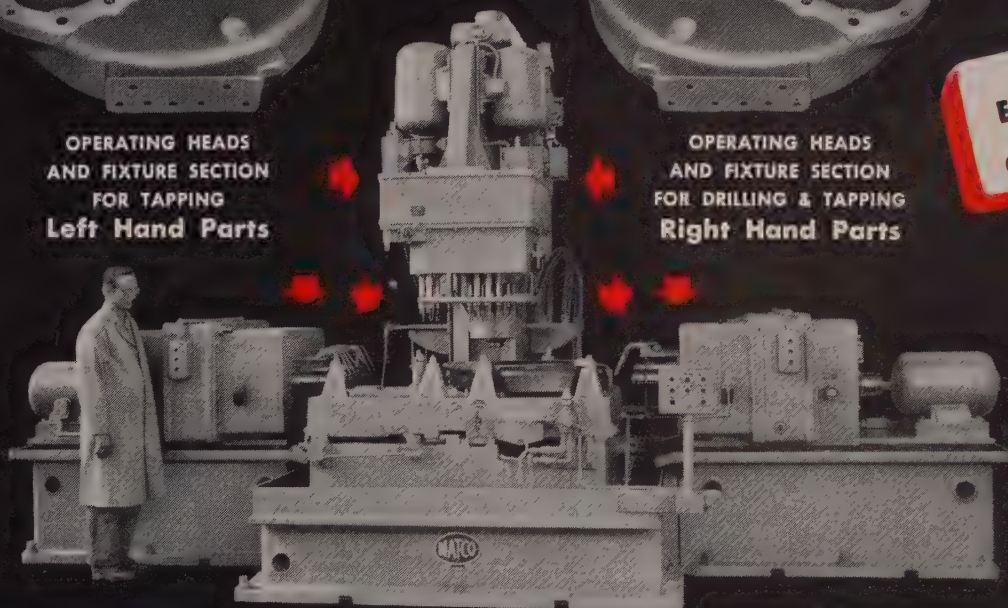


OPERATING HEADS
AND FIXTURE SECTION
FOR TAPPING
Left Hand Parts



OPERATING HEADS
AND FIXTURE SECTION
FOR DRILLING & TAPPING
Right Hand Parts

NATCO
ENGINEERED
for Quality and
Quantity Production



OPERATION DETAILS

LEFT HAND PART

POSITION 1

Remove and Load

POSITION 3

Vertical Head

Tap 4 Holes

L. H. Horizontal Head

Tap 4 Holes

POSITION 2

Vertical Head

Idle

L. H. Horizontal Head

Tap 3 Holes

RIGHT HAND PART

POSITION 1

Remove and Load

POSITION 3

Vertical Head

Drill 8 Holes

R. H. Horizontal Head

Tap 4 Holes

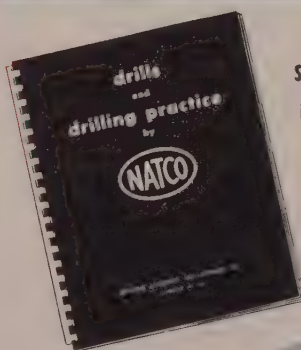
POSITION 2

Vertical Head

Tap 8 Holes

R. H. Horizontal Head

Tap 3 Holes



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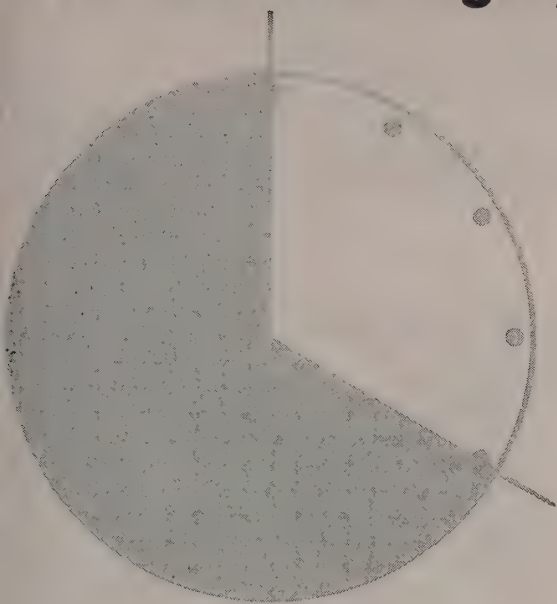
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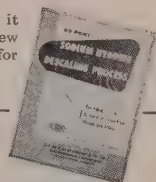
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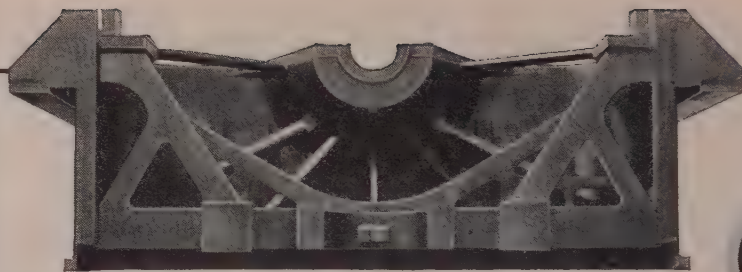
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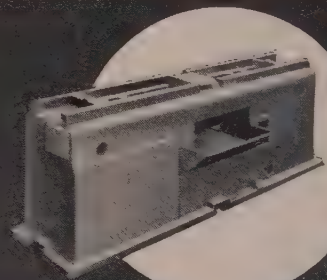
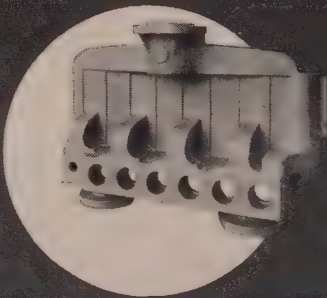
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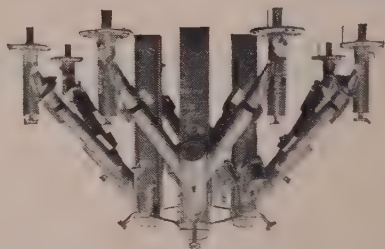
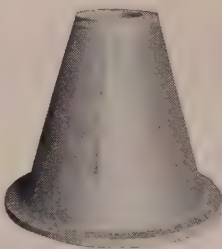
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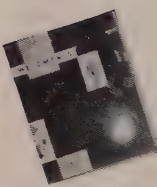
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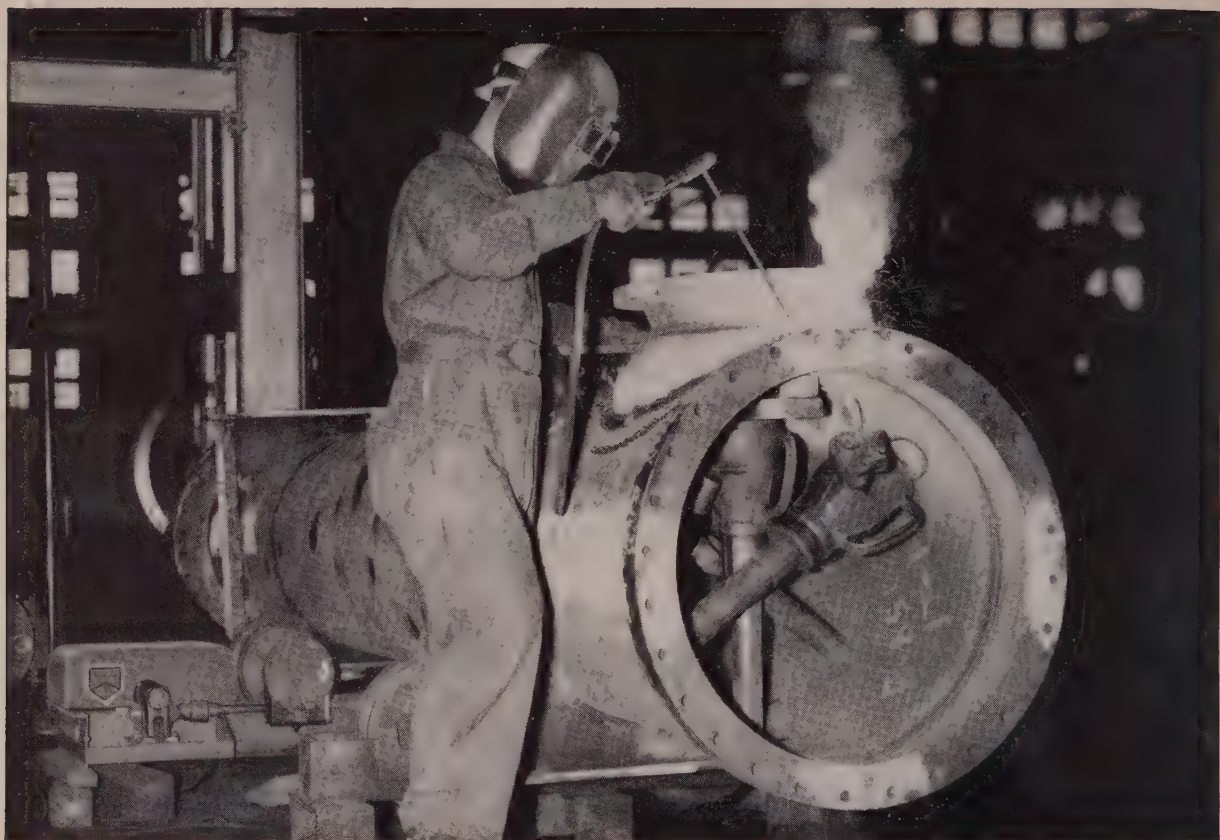
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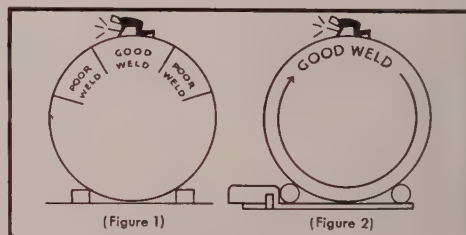
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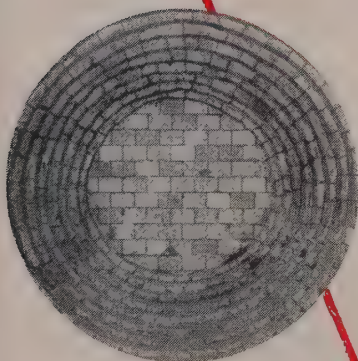


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—not a mere water soluble oil, but a fortified concentrate scientifically developed to give you "100 oils in one!"

E. F. HOUGHTON & CO.
PHILADELPHIA • CHICAGO • DETROIT • SAN FRANCISCO

**ANTISEP "saves the day"
for Cleveland valve manu-
facturer—cuts cost 50%!**

After several prominent cutting fluids had failed to meet requirements, this concern decided to try Antisept, diluted 25 to 1, in the machining of valve stems from 416 stainless steel. Warner & Swasey 5-spindle automatic screw machines were used. Result: lower costs, improved tool life, greater uniformity in pieces machined. Parts come off cool, permitting higher speeds and heavier cuts.



**Ready to give you
on-the-job service . . .**

For safety's sake, use smooth Youngstown Buckeye Conduit!

Youngstown manufactures full weight rigid steel electrical conduit from start to finish. There are many substitutes for rigid steel conduit, none possess all the overall safety features essential to permanent protection. On your next job, be 100% SAFE—be sure you get Youngstown Buckeye conduit.

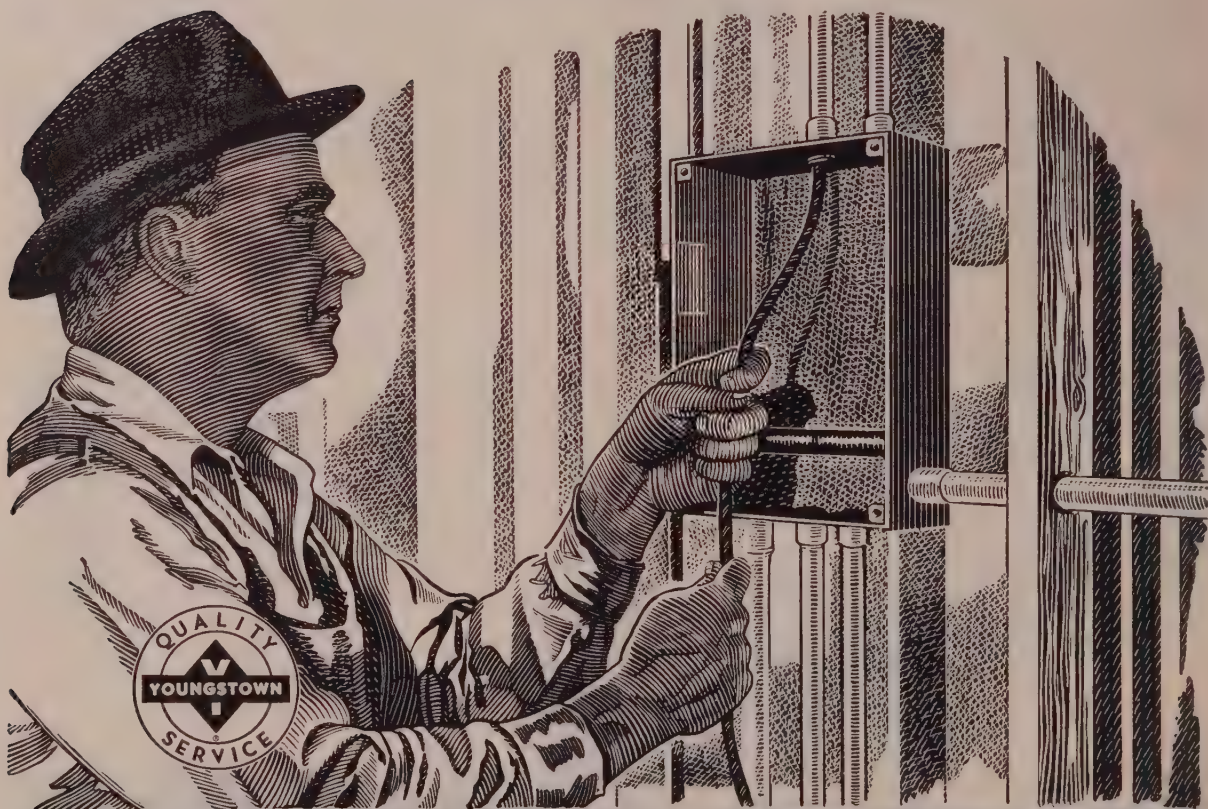


HERE'S A CONTRACTOR WHO DOESN'T TAKE CHANCES: "I'm never safe with conduit that dents, cracks or breaks easily and damages my wiring. That's why I always use Youngstown Buckeye rigid steel conduit. Its smooth interior finish protects wires when pulled and its tough exterior of high quality rigid steel withstands hard treatment."



APARTMENT OWNER SAYS THIS: "As a landlord, I've got to look into every angle for the safety and protection of my tenants. That's why I insist on Youngstown Buckeye rigid steel conduit to protect wiring. Buckeye is an investment that discourages amateurs and kids from fooling with wires. In my 25 years as a landlord, Buckeye has proved its value in resisting corrosion, dust and moisture."

Shipments of Buckeye rigid steel conduit are now being made from our conduit mills at Indiana Harbor and Youngstown.



THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yeloy Steel

General Offices: Youngstown 1, Ohio

Export Office: 500 Fifth Avenue, New York

COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

Got the angle . . .



for **BIG** volume pumping?

You get a new high in service from Fairbanks-Morse *Angleflow* Pumps. They're designed for BIG volume pumping against moderate heads — sizes range from 8 to 54 inches . . . capacities up to 80,000 GPM.

You can move big volumes of water with *low* operating and maintenance costs. These *Angleflow* Pumps, with their wide, unobstructed impeller and volute passages, are especially suitable for primary water supply service or for big booster pump service.

For information, see your local Fairbanks-Morse Pump Engineer . . . or write Fairbanks, Morse & Co., Chicago 5, Illinois.



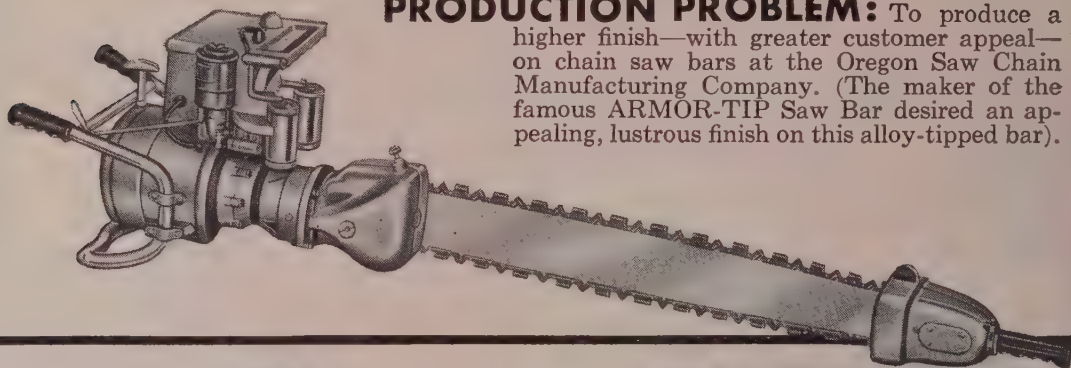
FAIRBANKS-MORSE

a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

HOW WOULD YOU **SOLVE IT?**

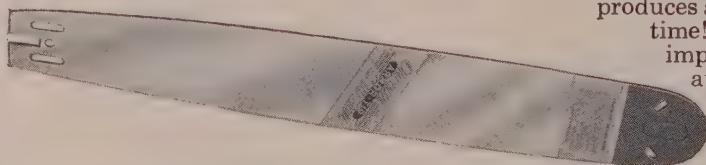
PRODUCTION PROBLEM: To produce a higher finish—with greater customer appeal—on chain saw bars at the Oregon Saw Chain Manufacturing Company. (The maker of the famous ARMOR-TIP Saw Bar desired an appealing, lustrous finish on this alloy-tipped bar).



1 A 3M REPRESENTATIVE analyzed the finishing operation and demonstrated how the 3M Backstand Method, using Three-M-ite Cloth Belts, would produce a better finish on the alloy tip than was achieved with a grinding wheel alone.

2 3M ALSO RECOMMENDED the right 3M Abrasive Belt on their Curtis Straight-O-Matic Grinder for final finish on saw bar surface. Previously, manufacturer had used a surface grinder for this operation.

3 NOW, this Portland, Oregon manufacturer produces a finer, more attractive finish in less time! Perhaps a 3M Representative can improve *your* company's finishing operations. His training and experience in industrial application of coated abrasives are available without cost or obligation.



WANT MORE **INFORMATION?**

Minnesota Mining & Mfg. Co.
Dept. 5193, St. Paul 6, Minn.

- ☐ Return this coupon today for more facts on 3M Abrasive applications.
- ☐ Have 3M Representative call.

Name.....

Company.....

Address.....

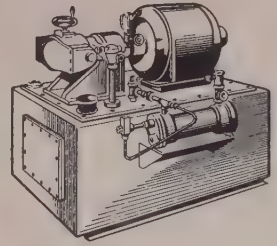
City.....Zone...State.....



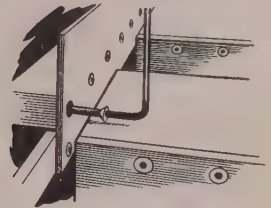
Made in U. S. A. by
MINNESOTA MINING & MFG. CO.
General Offices: St. Paul 6, Minn. In
Canada: London, Ont., Can., Export:
122 E. 42nd St., New York City.

Makers of "SCOTCH"® Pressure-Sensitive Tapes • "SCOTCH"® Sound Recording Tape • "UNDERSEAL"® Rubberized Coating
"3M"® Adhesives • "SCOTCHLITE"® Reflective Sheeting • "SAFETY-WALK"® Non-Slip Surfacing.

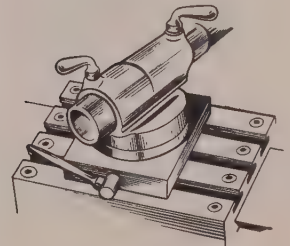
Our Fiftieth Year
A START FOR THE FUTURE



USE UNBRAKO FLAT HEAD SOCKET CAP SCREWS for assembling thin section materials —on piston assemblies, electronic devices and radios.



On sheet metal parts, thin plates, strips and moldings.



On bench lathe milling attachments and other production machinery.



UNBRAKO FLAT HEAD SOCKET CAP SCREWS have the following features: heat treated alloy steel for strength; form 82° angle under head for maximum contact;

accurate hex socket for positive, nonslip internal wrenching; fully formed threads—Class 3 fit; standard sizes—# 4 to 3/4"—in a full range of lengths.

Why pay much more for a special fastener?

Why pay high prices for a special, when a standard UNBRAKO socket screw will do the job as well. Delivery of a standard is much better, because it is stocked by your local industrial distributor. Write for UNBRAKO Standards. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

UNBRAKO®

SOCKET SCREW DIVISION

SPS

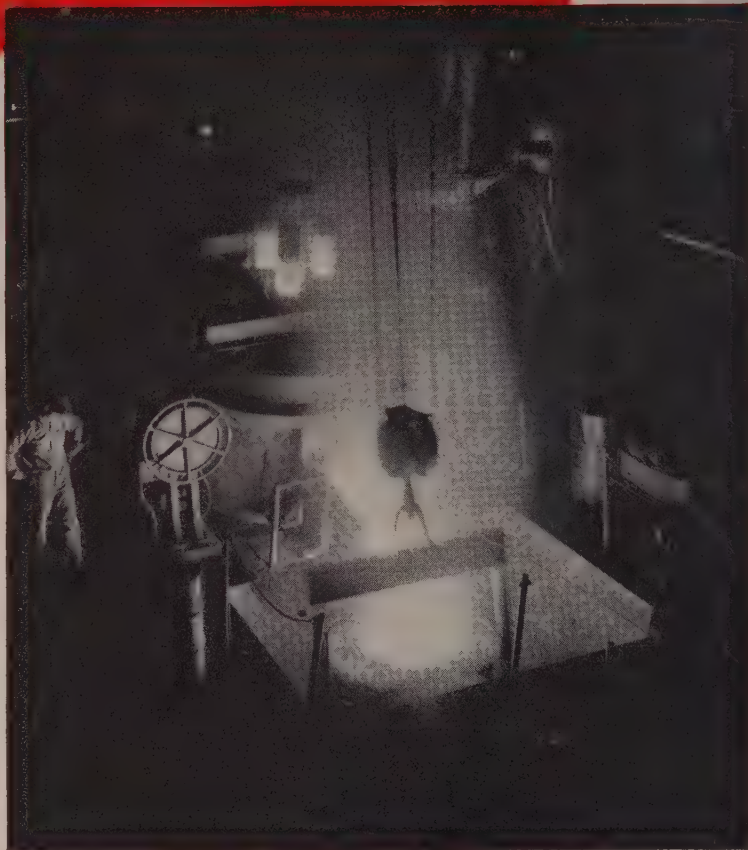
JENKINTOWN PENNSYLVANIA



Write for UNBRAKO Standards

**Highest quality HESCO steels pass
100% radiographic inspection!**

*Lectromelt** Furnace's
pin-point control
helps make it possible
with savings in
labor, power and
downtime.



"We have to be able to turn on a dime. We need that kind of versatility and our Lectromelt Furnace gives it to us," says Hartford Electric Steel Corporation, Hartford, Conn. And, government specifications for guided missiles require HESCO steel to pass 100% radiographic inspection.

Their CQT Lectromelt Furnace permits exact temperature control and precise analysis control... lets them duplicate melt after melt, or shift into high gear fast when the next heat must be a different alloy.

HESCO top-charges their new Lectromelt in 5 minutes as against a former 25 minutes for door-charging their old furnace. This cuts downtime and saves many man-hours of labor daily. It saves power because the furnace stays hot and ready to go on a new heat.

Write for Bulletin #9, telling you what Lectromelt Furnaces will do to help you keep ahead in the field. Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

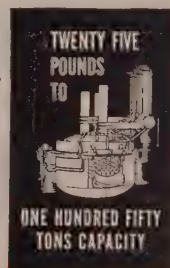
Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

*REG. T. M. U. S. PAT. OFF.

MOORE RAPID

WHEN YOU MELT...

Lectromelt





Here's striking evidence of insulating ability: Though one end of this brick is incandescent—having been heated to over 2000 F—the other end is held in the bare hand.

'Bubble-Brick' insulates at over 3000 F

ictured here is one of the most heat-resistant refractories available — and one of the most stable. It shows very little shrinkage, or other changes, *even at maximum burning temperatures of most fuels!* It stands higher heats (has a P.C.E. value 39-40, equivalent to 3389-3425 F), and greater loads than previously possible with low heat capacity refractories.

ALFRAX® BI refractories are literally *made of bubbles*; hollow spheres of Al_2O_3 specially bonded together. They are light in weight (a 9" straight weighs only 4.8 lbs.); have low thermal conductivity (average 7 Btu/hr, sq ft and °F/in. of thickness at 2200 F); and therefore have low heat capacity. They are also one of the most inert materials known. They are unaffected by furnace atmospheres, or combustion gases of commercial fuels.

These "bubble-brick", as they are sometimes called, are used in main linings as sidewalls, arches, doors, etc., and also for packing-up linings. They are used in many types of furnaces (e.g. powdered metallurgy furnaces, aluminum reverberatory furnaces, ceramic kilns, synthesis gas generators). The advantages are: longer refractory life, closer heat control, and a furnace that heats up quicker and needs less fuel.

ALFRAX BI aluminum oxide refractory is available as brick, special shapes, standard cements, and as a *castable* cement that you just mix with water and pour. For information about the properties of this and other unusual super refractories by CARBORUNDUM just mail this coupon.

CARBORUNDUM

Registered Trade Mark

Dept. G-93 Refractories Division
The Carborundum Company
Perth Amboy, N. J.

Please send free copy of Super Refractories booklet to:

Name _____

Position _____

Company _____

Street _____

City _____ Zone _____ State _____

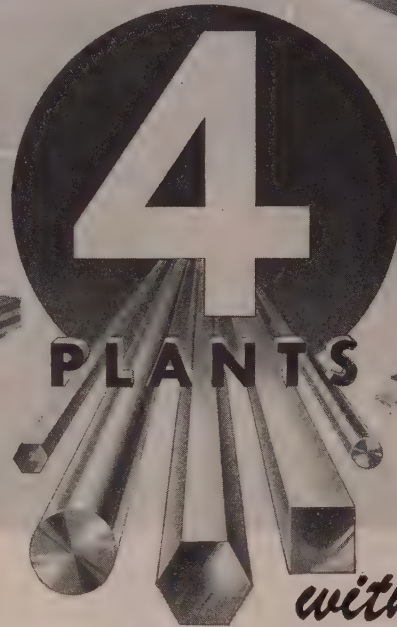


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BUFFALO, N. Y.

DETROIT, MICH.

MANSFIELD, MASS.



To Serve You *with Fine Quality* **COLD FINISHED BAR STEELS**

To supply American industry economically with top-level production steel is the goal of our continuing expansion program.

The latest step in the program is the construction of our New Detroit Plant located at 8 Mile and Hoover Roads.

The first section . . . now completed and in operation . . . is one of four units scheduled for this site. It provides service throughout the Detroit area and surrounding territory for a quality line of Carbon and Alloy Bar Steels.

For 62 years, we have specialized in the manufacture of dependable Cold Finished Steel Bars that help users to maintain high production and insure finely finished parts at lower costs.

Bliss & Laughlin experience is your assurance of getting the right steel for the job.

SINCE 1891 PRODUCERS OF

**Cold Drawn Bars
Turned & Polished
Bars**

**Ground Shafting
Screw Stock**

**Extra Wide Flats
Carbon & Alloy
Steels**

**Strain-Tempered
Bars**

BLISS & LAUGHLIN, INC.

**GENERAL OFFICES: HARVEY, ILLINOIS
SALES OFFICES IN ALL PRINCIPAL CITIES**

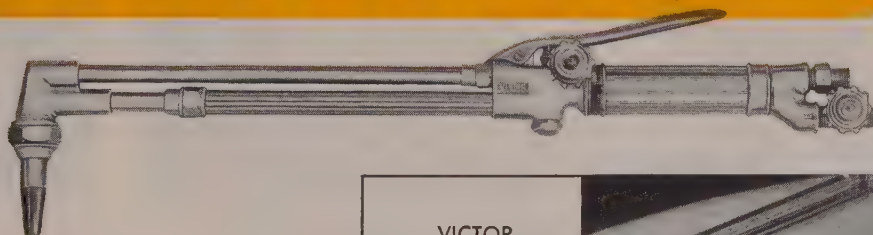


FOUR PLANTS: HARVEY, ILL. • DETROIT, MICH. • BUFFALO, N. Y. • MANSFIELD, MASS.



**the
man
on the
job...**

...Wants VICTOR Reliability



He gets reliability and efficiency in VICTOR welding and cutting torches, and regulators because they're built right.

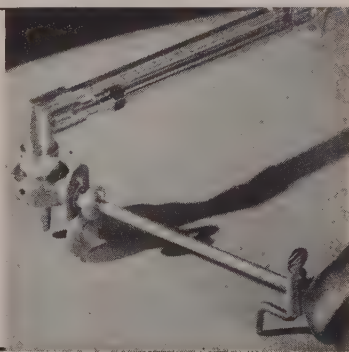
Precision machining assures leak-proof joints and ease of maintenance. Four head angles—90°, 75°, 45° or straight—and 4 lever positions—top or bottom and forward or rear of handle—enable you to choose the torch that exactly fits the job in hand.

VICTOR's complete range of tips, in sizes 000 through 16, are designed to give maximum cutting speed and gas savings on any job from light sheet to heavy plate cutting.

See for yourself why it costs less to own and operate VICTOR. Ask your VICTOR dealer for an on-the-job demonstration *TODAY*.

VICTOR
CIRCLE CUTTING
ATTACHMENT

adjusts to
various heights
and diameters
from 1¼" to 28".



VICTOR

Welding and Cutting Equipment
Since 1910

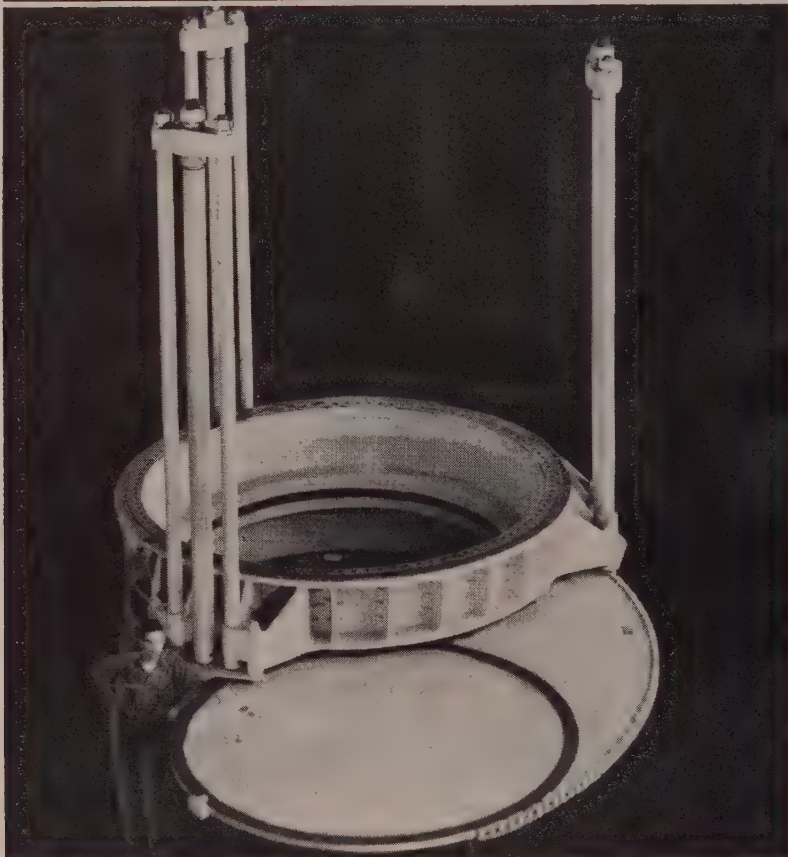
VICTOR EQUIPMENT COMPANY

3821 Santa Fe Ave.
LOS ANGELES 58

844 Folsom Street
SAN FRANCISCO 7

1312 W. Lake St.
CHICAGO 7

HOW A FORCE OF NATURE IMPROVES STEEL MILL SAFETY



Designed to protect men and equipment, this heavy duty Bailey Valve was produced for one of the nation's major steel makers. Although its diameter is 120" and its weight is close to 42,000 lbs., it is precisely machined to assure a tight, positive gas seal.

AN UNFAILING force of nature—the linear expansion and contraction of steel—is being used to increase steel mill safety. This powerful force, applied to Bailey Thermal Expansion Goggle Valves, provides a safe, dependable means of positive shutting off large gas mains in emergencies or for repairs.

The Function of Goggle Valves

Ranging in diameter from 36" to 120", this type of valve long has been indus-

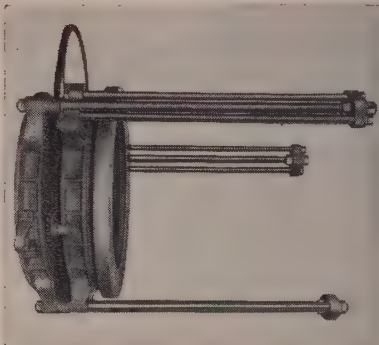
try's standard method for controlling gas in the large mains for blast furnaces, gas washers and boilers. They take their name from one of their component parts—a large, moveable plate shaped like a pair of aviation goggles. This plate has one "goggle" open, the other of solid steel. When a gas main is in operation, the open goggle allows gas to flow through it freely; when the gas is to be shut off, the plate is moved until the closed

goggle blocks the main, forming a tight, leak-proof seal.

BAILEY THERMAL EXPANSION GOGGLE VALVES

Safety and efficiency in closing the larger sized gas mains are provided by Bailey Thermal Expansion Goggle Valves. In them, the powerful force of linear expansion and contraction of three steel tubes is used to free or clamp the goggle plate—providing an absolutely gas-tight seal.

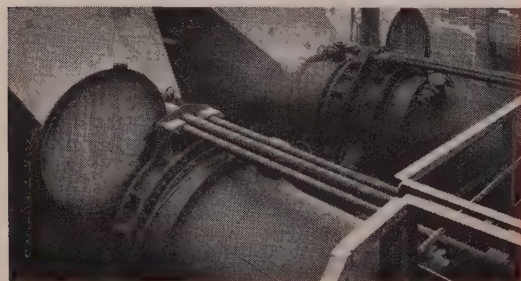
In operation, steam is passed into the tubes, which are spaced evenly around and perpendicular to the rigid steel flanges of the valve. The resulting expansion frees the heavy goggle plate so it may be swung to the open or closed position. When the steam is shut off, contraction of the tubes takes place, closing the flanges tightly against the goggle plate. Since both sides of the plate are machined to conform to the machined edges of the valve flange, Bailey Valves are leak-proof in both



Bailey Thermal Expansion Goggle Valves are produced in diameters from 36" to 120".

open and closed positions.

Sound design and precision manufacture are combined in these valves to assure the ultimate in safety and reliability. They have been thoroughly proved on the gas mains of blast furnaces, gas washers and boiler plants. Bailey Thermal Expansion Goggle Valves are completely dependable in hot or cold, dirty or clean gas mains.



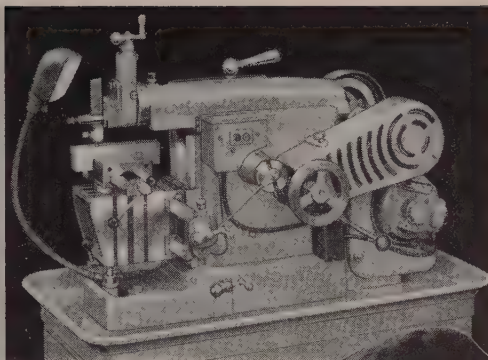
These valves are in service on an Elex Precipitator. In this view the goggle plates are in the open position.

WILLIAM M. **Bailey** COMPANY
ENGINEERS

1221 Banksville Road
Pittsburgh 16, Pa.

South Bend 7" Shaper

FAST • EFFICIENT • ECONOMICAL!



Watch your machining costs on small work go down when a South Bend 7" Shaper takes over.

FIRST, its speed — 42 to 195 strokes per minute reduces machining time.

SECOND, its 7" stroke will handle a good share of your small toolroom, maintenance and production jobs thus releasing your heavy shapers for larger work. This stops the waste of using excess machine capacity on small jobs.

THIRD, with its small initial cost, less power consumption and low upkeep expense, your equipment budget won't take a beating when you specify South Bend 7" Shapers. Find out how these fast, versatile shapers can save you money. Call your local South Bend distributor today or send the coupon for complete information.

SPECIFICATIONS

RAM

Stroke length.....0 to 7"
Strokes per min. (4)....42 to 195
Cutting speeds...3 to 114 feet
per minute

TOOL HEAD

Vertical travel.....3"
Tool post slot..... $\frac{3}{8}$ " x $\frac{7}{8}$ "
Head swivels.....360°
Clapper swivels.....35°

TABLE

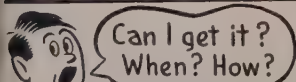
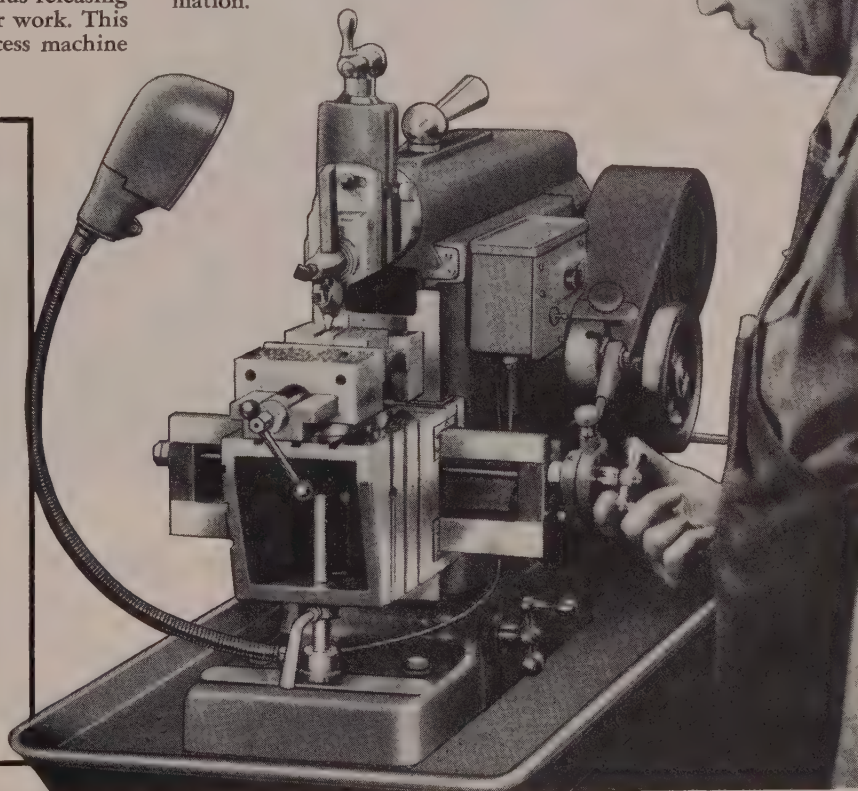
Vertical travel.....5"
Horizontal travel.....9 $\frac{1}{2}$ "
Power cross feeds (6)....0.002"
to .012" (reversible)
Size.....6 $\frac{5}{16}$ " x 5" x 5 $\frac{1}{8}$ "
Distance from ram... $\frac{1}{2}$ " to 5 $\frac{1}{2}$ "

WISE

Maximum opening.....4"
Jaw width.....4"
Jaw depth.....1"
Height over table.....2 $\frac{1}{16}$ "

MOTOR

$\frac{1}{3}$ or $\frac{1}{2}$ h.p.



Yes—you can get most any South Bend product immediately from our distributor's stocks in principal cities. Items not stocked, shipped promptly from factory.

Three Ways to Order:

1. See or telephone nearest distributor.
2. Order by mail from your distributor.
3. If no distributor is nearby, order direct from factory.

South Bend machine tools with accessories may be purchased on convenient terms up to 12 months.

PLEASE SEND INFORMATION CHECKED:

<input type="checkbox"/> 9" and 10" BENCH LATHES	<input type="checkbox"/> 10" to 16-24" FLOOR LATHES	<input type="checkbox"/> DRILL PRESSES	<input type="checkbox"/> 7" BENCH SHAPERS	<input type="checkbox"/> TOOL GRINDERS	<input type="checkbox"/> $\frac{1}{2}$ " & 1" Collet TURRET LATHES
--	---	--	---	--	--

Name _____ Company _____
Street _____ City & State _____



Building Better Tools Since 1906 • SOUTH BEND LATHE • South Bend 22, Indiana



You know you're on the right track

Director of destinations, the towerman deftly sorts out traffic . . . fans it out far and wide, so that the right shipments get to the right places at the right time.

The same practiced precision goes into traffic control in the modern mills at Bristol. Here every operation is safe in hands that have the same deft touch . . . that keep things moving so that every shipment of Brass sheet, rod and wire gets through to its destination without switch-

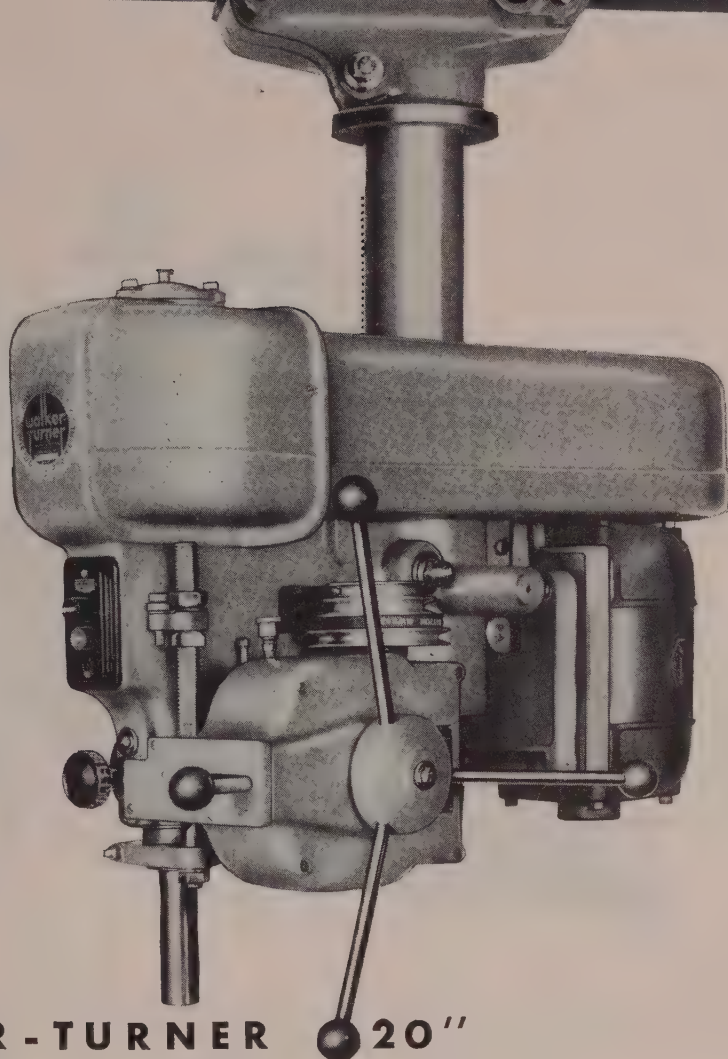
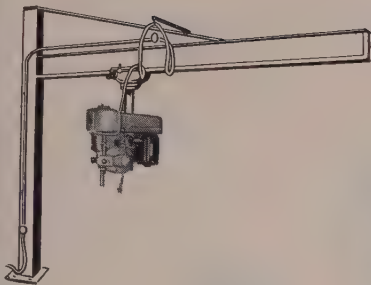
ing, sidetracking, or running behind time.

And this is just *part* of what is meant by "Bristol-Fashion".

. . . .

The BRISTOL BRASS CORPORATION, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means **Brass at its Best**



**This WALKER-TURNER 20"
OVERHEAD DRILL PRESS SET-UP
saves handling time . . . cuts costs**

Wherever large or heavy parts or units are to be worked, this set-up—utilizing a WALKER-TURNER DRILL HEAD with its special ball-bearing carriage traveling along a boom—can save handling time and costs . . . bring new production economies. Special set-ups like this make it possible to get WALKER-TURNER precision drilling (either hand or power feed) at surprisingly low cost.

WALKER-TURNER

• DIVISION •

KEARNEY AND TRECKER CORPORATION
PLAINFIELD, N. J.

DRILL PRESSES—Hand and Power Feed • RADIAL DRILLS • Wood and Metal Cutting BAND SAWS • TILTING ARBOR SAWS • RADIAL SAWS
JIG SAWS • LATHES • SPINDLE SHAPERS • JOINTERS • BELT and DISC SURFACERS • FLEXIBLE SHAFT MACHINES

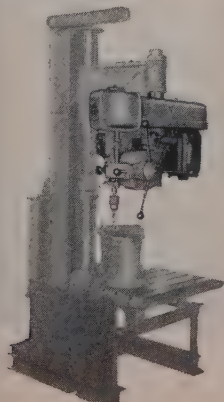
SOLD ONLY THROUGH TRAINED INDUSTRIAL DISTRIBUTORS

Almost Unlimited Application

WALKER-TURNER Drill Heads may be used for almost unlimited applications. The illustration left shows a set-up in daily use performing as a radial drill of extra large capacity.

Horizontal and angular mountings—in single units or in batteries—are making substantial savings for hundreds of manufacturers.

For complete information, write your name and address in the margin of page.



Use this space

to write for full details and specifications.
Walker-Turner Division, Kearney & Trecker Corp.
Dept. S9, Plainfield, N. J.

(Please write your name and address in margin of page)



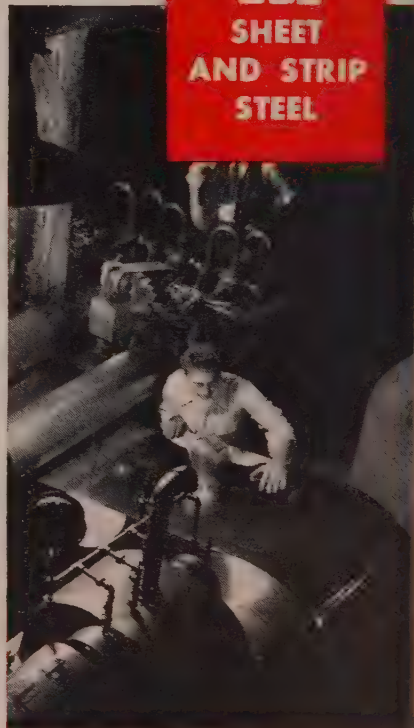
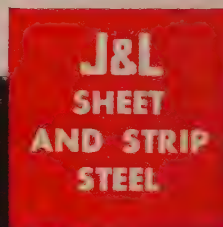
Like the works of a fine watch . . .

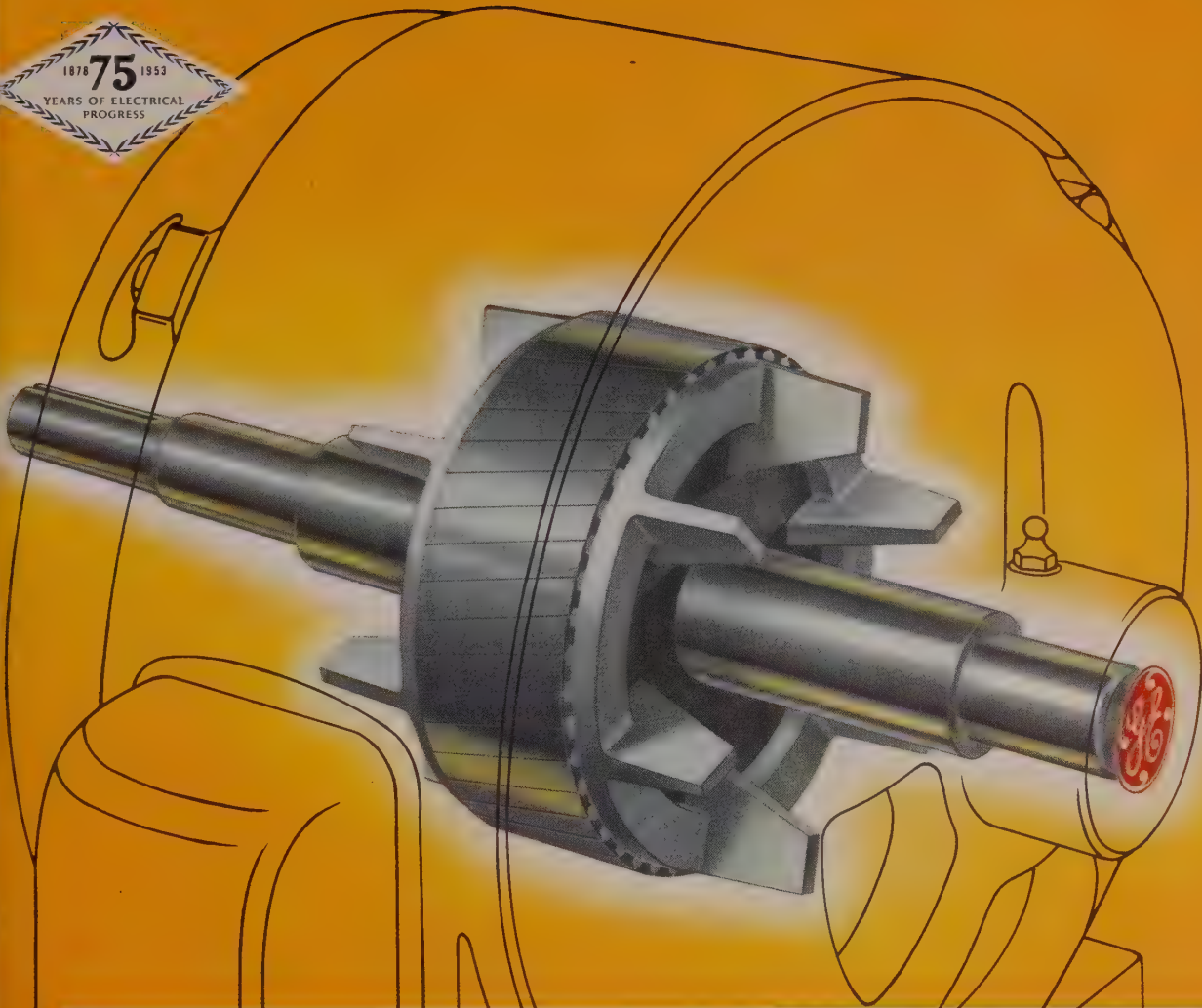
**STEELMAKING, TOO, REQUIRES
THE UTMOST PRECISION**

Whatever your requirements for formability, uniformity, or drawing qualities, you'll find J&L Sheet & Strip . . . accurately and faithfully produced to meet your specifications. Complete understanding of the end-use of the sheet or strip you order is a rigid requirement of J&L production. You can depend upon J&L products to fit your production line.



**JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH**





Why rotors don't fail in G-E **TRI-CLAD** motors

REG. U.S. PAT. OFF.

G-E pioneering and research developed and produced this one piece cast-aluminum rotor winding, which has virtually eliminated rotor failures in Tri-Clad motors.

Rotor is indestructible in service because the bars, end rings, and fans are a "one-piece" casting. No brazed joints, no fabricated fans to come apart.

Rotor inertia is reduced by the lightness of the aluminum, thus raising efficiency and allowing easier starting, stopping and reversing.

Rotor efficiency is higher, operating losses reduced, as the result of a special chemical treatment.

The motor runs cooler because the integrally cast fans dissipate heat faster.

Operation is smooth and quiet due to the dynamic balancing of the rotor which also reduces bearing wear and material fatigue.

Long rotor life is one more reason why G-E Tri-Clad motors last longer — give you more reliable service and greater operating economy.

Order Tri-Clad motors today from your nearby G-E representative. You'll find popular models in stock. General Electric Co., Schenectady 5, N. Y.

752-20

You can put your confidence in—
GENERAL  ELECTRIC



When Nobody Knows the Answer

One of these days you may come face-to-face with a metal problem that does not seem to have an answer.

That is the time to think of these International Nickel Company metallurgists. They are constantly improving and modifying nickel alloys to meet new conditions. They are always ready to help you with specific problems involving metals for destructive service conditions.

Over the past 50 years, Inco has developed a family of metals for hundreds of different applications. In one branch of the family, for example, is a group of heat-resisting alloys—Inconel®, Inconel "X"®, the Nimonic® Alloys and Incoloy®—all now important in high temperature work.

Elsewhere on the family tree, you will find other alloys—each with certain special characteristics. Often, there is a better-than-even chance that one of Inco's alloys offers exactly the properties you are looking for.

Of course, this does not mean that somebody at Inco can dip into the files and come up with a pat answer to every new problem. All the answers have not been found yet. But a tremendous amount of research has been done, and you can probably benefit in one way or another from it.

When nobody knows the answer, Inco's metallurgists keep going until they have investigated all possible metals and alloys that might

do the job. In fact, the men in Inco's Technical Service (and in their Corrosion Engineering and High Temperature Engineering Services, as well) have one primary goal: to help you determine whether an Inco Nickel Alloy or some other metal will serve your purpose best.

No matter what your metal-selection problem may be, all the technical facilities of Inco are available to help you solve it. There is no charge, no obligation of any kind. For prompt technical help whenever you need information about metals, all you have to do is get in touch with: "Technical Service,"

THE INTERNATIONAL NICKEL CO., INC.
67 Wall Street, New York 5, N. Y.

NICKEL ALLOYS



MONEL® • "R"® MONEL • "K"® MONEL • "KR"® MONEL

"S"® MONEL • INCONEL® • INCONEL "X"® • INCONEL "W"® • INCOLOY®

NIMONIC® ALLOYS • NICKEL • LOW CARBON NICKEL • DURANICKEL®

Metalworking Outlook

September 21, 1953

In a Month: Decision on Aluminum

The Office of Defense Mobilization won't reach a decision on the proposed third round of aluminum expansion for another month. The decision will depend on what the Defense department thinks necessary for the mobilization base. ODM's decision is not contingent upon—and may be made before—the District Court in New York rules on whether Aluminum Co. of America will be allowed to carry out its contract to buy 600,000 tons of Canadian aluminum.

Dynamic Growth

Although ODM is considering closing out some 150 of the 233 goals in its mobilization expansion program, such action will have significance only for the moment. The expansion program will be reviewed periodically so that any goal closed out now might be reopened later if the circumstances required it.

Conformity, Plus

The majority of today's new plants are going into zoned areas, according to a preliminary study by Society of Industrial Realtors of 137 factories built within the last five years. Some 90 per cent of the new facilities surveyed are one story; nearly 60 per cent have only one building. The structures more than meet local zoning regulations: More than two-thirds occupy 25 per cent or less of their sites; more than half are set back 99 feet or further from streets—a voluntary distance much greater than any usually required.

West Germany Moves In

West German capital is being exported. The nation's currency exchange regulations have been relaxed now that it has a growing and favorable foreign trade balance. Canada gets 27 German branch plants, with 12 in Newfoundland, six each in Quebec and Ontario, two in Manitoba and one in British Columbia. One source for German funds is the \$15 million that American soldiers are spending monthly in Germany.

Rural Market: Vigorous

Farm equipment sales are in the doldrums now, but don't underestimate the vigor of the rural market. An indication of that strength is the fact that the 4-millionth rural consumer began receiving electricity from REA-financed power systems during the week of Sept. 14. With the program now in its 19th year, about 90 per cent of all U.S. farms today are served by electricity. They're all potential customers for electrically driven equipment.

Defense Department Project

The Defense department is pushing a plan that would require all suppliers of steel and nonferrous shapes to the armed services to identify

Metalworking

Outlook

their product with a uniform marking system beginning sometime in 1954. The Defense department's concept of a marking system to identify alloy steels has been broadened to include all rolled metal shapes—ferrous and nonferrous, alloy and nonalloy. Defense department's Office of Standardization is starting to prepare a proposed military marking standard that will probably use a printing, rather than a color, system.

What's in a Name?

The name changes again. The agency that is to succeed NPA as administrator for the remaining controls on materials will be called Business & Defense Services Administration, not Business Services Defense Administration as once planned. Besides NPA, BDSA will take over the Commerce department's existing Offices of Distribution and Domestic Commerce. Activities of Commerce's Offices of Business Economics and International Trade will remain separate from BDSA, but they will be expanded.

A Divorce Is Sought

Watch for a union drive to divorce industrial pensions from Social Security. Under the revised Ford Motor Co. formula, maximum benefits now are independent of Social Security, points out Edwin Shields Hewitt & Associates, a management organization in Libertyville, Ill. The new union attitude stems partly from the fact that, when Social Security payments were increased in 1952, many employees did not receive the additional benefits. Most retirement plans now specify a scale of benefits "including Social Security payments."

Straws in the Wind

The 1954 Nash will offer as optional equipment an air conditioning device reportedly designed by Kelvinator along entirely new lines . . . Monroe Auto Equipment Co., which this year announced a new power steering unit of the linkage type, reports that the device is being delivered to six automakers for use on 11 1954 models . . . The \$400 million to \$500 million cutback by the Air Force in jet and piston engine orders is in line with cutbacks in planned plane production . . . The Navy will let contracts for construction of 165 vessels, including a third Forrestal-class supercarrier, 14 destroyers, minesweepers and other ships and 150 landing craft . . . Direct nonmilitary aid from the U.S. to foreign countries is nearing an end, says Commerce Secretary Sinclair Weeks.

This Week in Metalworking

We are in the midst of an inventory shake-out, called "healthy" by most economists (p. 85) . . . Watch for a market by 1960 for 200,000 heat pumps annually (p. 86) . . . Prospects are shiny for metal foil manufacturers (p. 87) . . . Ohio Hoist & Mfg. Co. fights back in a labor dispute (p. 88) . . . The U.S. defense equipment disposal policy will be outlined soon (p. 89) . . . Sales dip, but there are no tears from machine tool distributors (p. 90) . . . Aircraft manufacturers are making progress in a program to control costs (p. 91) . . . Despite a few big orders, freight car production is sluggish (p. 96).

After two years' exposure in a corrosion-test yard, this is how two painted samples looked. The corrugated 28" x 36" sample at the left is regular untreated galvanized steel. Note how the paint has flaked and peeled away

from the zinc coating over parts of the entire panel. Sample at the right is Armco ZINCGRIP PAINTGRIP. Here the paint is just as smooth and beautiful as the day it was put on. No cracking or flaking of the paint occurred.



Special zinc-coated steel **DOUBLES PAINT LIFE**

Tests show paint life on special zinc-coated Armco ZINCGRIP PAINTGRIP sheets is at least *several times longer* than on regular galvanized surfaces or uncoated steel.

The reason is a mill applied Bonderized finish on top of the zinc coating. This finish takes paint immediately and helps preserve it. No acid etching or surface treating of any kind is needed.

With ZINCGRIP PAINTGRIP you give your painted products and equipment these profit-and-sales advantages: *Lower finishing costs, longer lasting and more attractive products, and more satisfied customers.*

Besides assuring longer paint life, Armco ZINCGRIP PAINTGRIP provides unbroken zinc protection for sharply curved sections as well as flat parts. Blanks can be formed or drawn without flaking or peeling of the special zinc coating. This coating takes as severe a draw as the base metal.

Maybe you can profit from this double-edged sales mover and shop saver. Armco ZINCGRIP PAINTGRIP has a record of more than twelve years in proved service. It was the *first* hot-dip zinc coated sheet and strip steel that could be severely formed and drawn and painted immediately without pre-treatment.

ARMCO STEEL CORPORATION

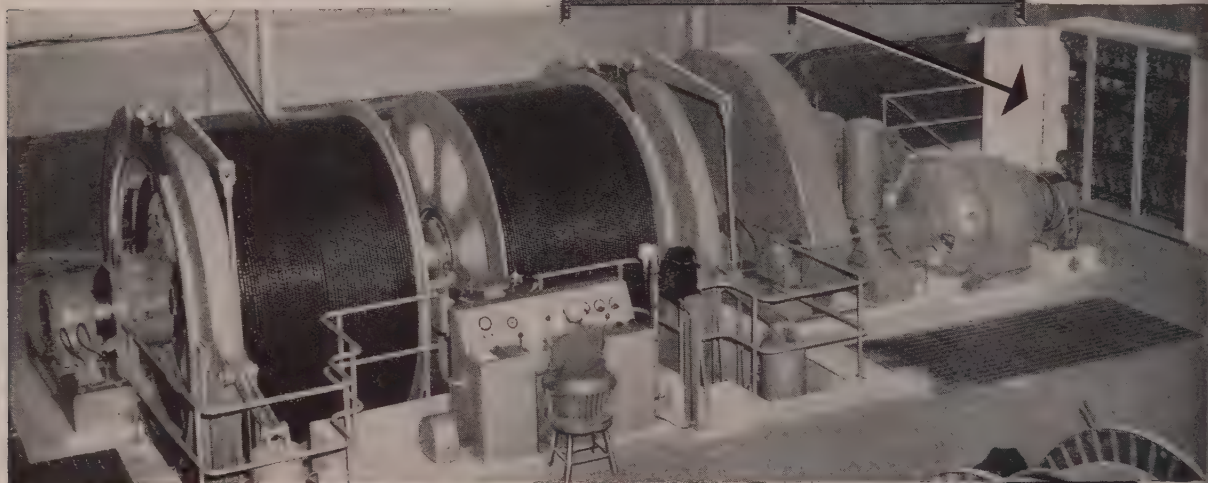
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a job for EC&M Frequency Relay Control...



Installation in northern New Jersey of Nordberg balanced double cage slope hoist operated by two wound-rotor motors under EC&M Frequency Relay Magnetic Control.



Cage Creeps Up Or Down—Runs at Full Speed — Is Slowed Down From Operator's Master Switch.



PERFECT CONTROL

SMOOTH RIDE FOR MEN OR MATERIALS

- 1 Cage creeps to stop with passengers.
- 2 Cushioned acceleration during hoisting and lowering.
- 3 Slowdown by motors—EC&M Type WB Brakes set and hold the load.
- 4 Slow speed for rope inspection—about 12% of normal hoisting speed.

The passengers enjoy a velvet-smooth ride on this mine-hoist. EC&M Frequency Relay Control permits adjusting the torque of the two 200 hp, 440-volt wound rotor induction motors to cause the cage to creep, to run at full speed, or to operate at intermediate reduced speeds. The operator's multi-speed-point EC&M Cam Master Switch makes speed selection quick and sure. EC&M Frequency Relays automatically switch motor connections to maintain safe operation under all conditions. Because of the highly efficient operation throughout the past five years of a similar hoist equipped with EC&M Frequency Relay Control, the user specified EC&M Control for this latest hoist installation. If you have a hoist problem, it will pay you to look into EC&M Control.

No. 28 ACCELERATOR Bulletin describes this EC&M hoist control system. Write for your copy.



THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO



September 21, 1953

Painful Lesson

Few thoughtful persons were surprised when the resignation of Secretary of Labor Martin Durkin brought about the first break in President Eisenhower's cabinet within eight months of the time his new administration assumed office. Events have proved that the appointment of this Democratic labor union leader not only was a deplorable mistake but also was as "incredible" as the late Senator Taft intuitively described it.

Whoever sold the President on appointing Mr. Durkin probably did so on the theory that it would win support for the administration from labor union leaders and more votes from the rank and file of union members. This reasoning was faulty on two counts. First, Mr. Durkin was not influential enough to win support from top union chieftains for anything. Secondly, union members do not vote according to the wishes of their union leaders—as attested by the elections in 1950 and 1952.

Durkin's break with President Eisenhower came when the latter refused to go along with the 19 amendments to the Taft-Hartley Act which Durkin had proposed. Most of these amendments were favorable to union leaders. Congress—even more critical of union demands than the new administration—would not adopt them.

Right here it is well to remind ourselves how Congress has voted on labor legislation. The Wagner Act was passed in 1935 with a vote of 63 to 12 in the Senate and with no vote recorded in the House. In 1947, when Congress felt the Wagner Act was too one-sided in favor of unions, the Senate voted for the corrective Taft-Hartley Act 68 to 24 and the House concurred 320 to 79. President Truman vetoed the bill, whereupon the House overrode the veto 331 to 83 and the Senate smacked it 68 to 25. The cold fact is that Congress cast more affirmative votes for Taft-Hartley than for Wagner.

In the public interest, it is important that no group be given too much power. Union leaders already have more than they need. Millions of citizens know this and will vote accordingly. Congress knows it. Taft knew it. Eisenhower advisers now should recognize it.

E. L. Shaner
EDITOR-IN-CHIEF

PLANTS ARE DIFFERENT: In connection with the ever-present problem of labor relations, it is an unfortunate fact that under conditions existing today, a small or newly or-

ganized metalworking establishment may encounter critical union problems even before it is prepared to deal with them effectively. In this issue (p. 88) our editors present a case study

of a small company whose union problem probably is typical of hundreds of other companies.

This and other cases emphasize the fact that a union contract agreed upon by several large companies immediately becomes the pattern for all other companies in the same or affiliated categories. Often this is terrifically unfair, because the conditions of employment, cost of living, etc. vary so drastically.

The big opportunity for improvement in labor relations in the next decade lies in the largely unexplored field of patterning union contracts to the peculiar needs of specific companies. The present idea that all companies—large and small—present a uniform target for union exploitation, is unrealistic.

* * *

GERMANY VEERS RIGHT: Results of the recent election in Germany are of considerable interest to Americans and others who have a stake in the ultimate status of Western Europe. There are several reasons why the really phenomenal victory of Chancellor Adenauer are pertinent to American interests.

One is that the absolute majority of Adenauer, in addition to the rather pitiful showing of the splinter parties, places West Germany in the enviable status of a two-party system republic. It is a long time since a German leader has been able to rule without the aid of a coalition government.

A second point, and one that may become extremely important in world-wide commerce, is that the Adenauer victory means promotion of the free enterprise system, a rejection of cartelization and a shunning of socialistic proposals.

* * *

STARTED ABOUT EVEN: Last week 335 motor vehicles of early make journeyed from Cleveland to Columbus to Toledo to Detroit in the 1953 version of the annual Glidden tour. The cars in the tour represented about 90 of the nearly 2000 makes that have been introduced since the first automobile was built.

As one viewed these spick-and-span old timers, among which was a liberal sprinkling of European models, one was prompted to ask why the United States has outdistanced other nations in the output of motor vehicles by such a large margin. At or near the turn of the century half a dozen nations were on a more

or less equal footing in automobile production. As a matter of fact, France turned out more cars than the United States for a number of years. Today automobile registrations in the United States are roughly two and one-half times the number of registrations in all other countries of the world combined. Production at six million cars annually far exceeds that of any other country.

* * *

MASS BUYING POWER: Readers doubtless can think up dozens of good reasons why the United States has gained this tremendous lead in the production and use of automobiles. Among them are the ingenuity of manufacturers in developing mass production and the clever co-operative achievement of engineers, designers and salesmen in successfully inducing automobile owners to trade in old models for new models at increasingly frequent intervals.

But beyond these and similar reasons is the fundamental fact that buying power is more widely distributed in our nation than in any other large country. This broad distribution of buying power makes for mass consumption, without which mass production would be futile. Six or seven large nations could do easily what has been done in the United States if the people in those nations were willing to work toward a wider distribution of buying power.

* * *

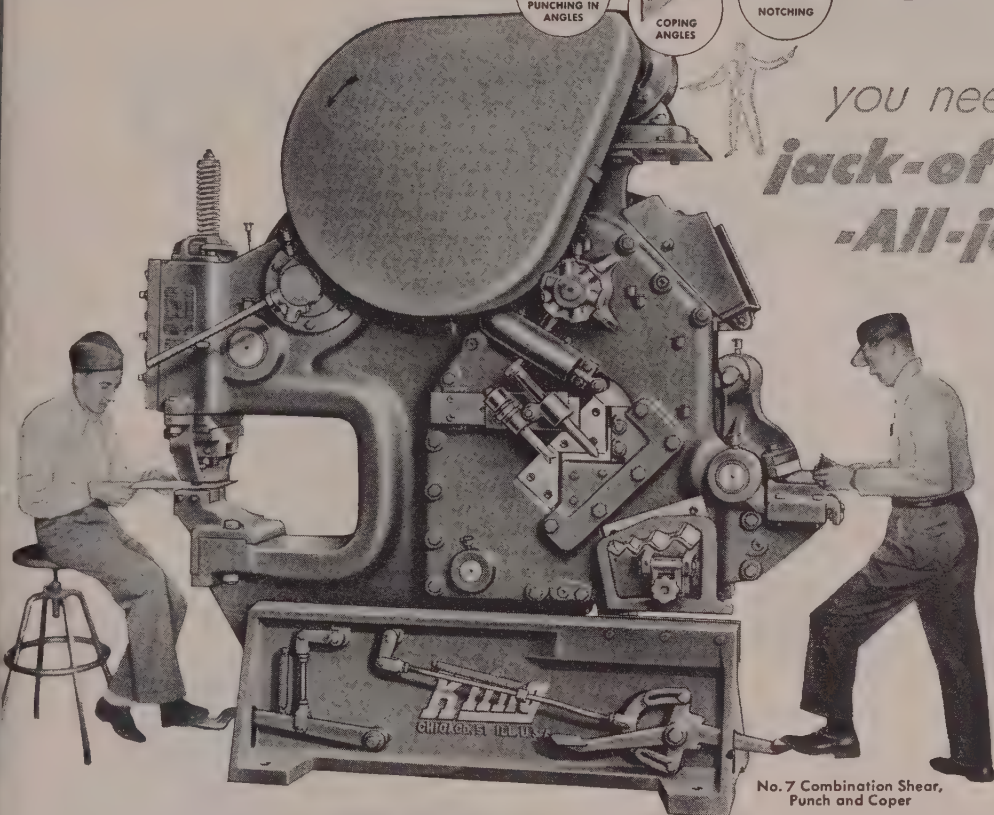
WHERE WE ARE WEAK: Christy A. Wilkin, vice president of research and engineering, Rockwell Mfg. Co., has returned from a three-month tour of European industrial centers (p. 95) with a significant observation concerning skilled manpower. He reports that "Europe is guaranteeing for itself a permanent reservoir of highly trained machinists and tool experts through its apprentice system." He found many plants training from 10 to 500 apprentices from 14 to 17 years of age.

American manufacturers will do well to note this tremendously important development in Europe and to do something immediately to improve apprenticeship in the United States. In many metalworking establishments too few apprentices are being trained and frequently the training is not as good as it should be. Today apprenticeship training is one of the weakest features of American manufacturing.

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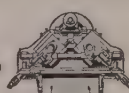
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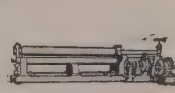
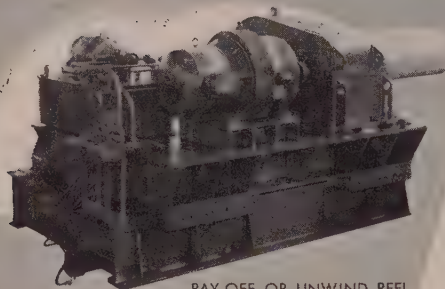
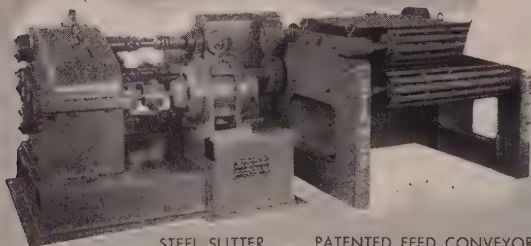


Plate Bending Rollers

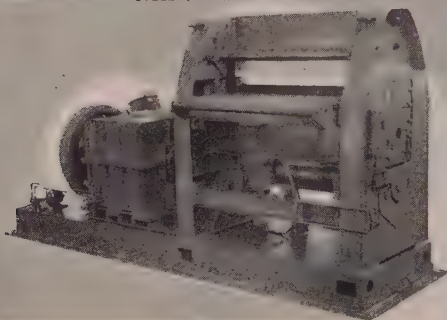
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SHEET RESQUARING UNIT



STAMCO, Inc., New Bremen, Ohio

Inventory Shake-outs Helping Industry to Gain Stable Footing

Industry is reducing its stocks. The move is orderly, moderate and healthy. It doesn't look to be as severe as the 1949 adjustment



THE NATION'S economy is in the midst of an inventory shake-out.

Thus far, it shows no signs of being as severe as the 1949 inventory adjustments which led to a mild recession.

Optimistic — The consensus among business leaders interviewed by STEEL is: "This is a healthy development, long overdue. It's a result of better materials supplies. Purchasing agents are realizing that they no longer need to stock the volume they held during the shortages as insurance."

In February, 1949, the month with the highest inventories for that year, durable goods manufacturers had stocks worth \$16.0 billion. That was 2.2 times their sales for that month of \$7.3 billion. In November, the month with the lowest inventories for 1949, durable goods manufacturers had stocks worth \$13.2 billion. That was only 2.0 times their sales for that month of \$6.6 billion. In July, 1953, the latest month for which figures are available, durable goods inventories reached \$26.0 billion, 2.1 times the \$12.2 billion in sales.

Trend Is Down—That July figure is not alarming; in fact, the stock-sales ratio is still a little under the July, 1952, figure. But indications are that durable goods inventories have declined steadily since July, despite consumer durables, which have gained slightly

because of heavy auto production.

The Purchasing Agents Association of Chicago in its August survey says: "Shrinking inventories are indicative of a general conservatism resulting from high prices, a drop in unfilled orders of scheduled business, faster vendor performance and good production." A survey by National Industrial Conference Board of 189 manufacturers regarding second-half prospects said: "Almost half the firms expect to reduce inventories in relation to sales during the second half, compared with only a fifth which indicate a relative rise."

Raw Materials First—A STEEL check on the situation indicates that the adjustment is starting in an orderly way, at the beginning in metals and raw materials. Foundries are frequently cutting down on stocks of coke and pig iron. Some in the Chicago area are whittling down to as low as 10-12 days' supplies. Steel salesmen also report their customers show an increasing trend to live off their inventories. Right now about as much steel as ever is going into durables, but more of it than formerly is coming from stocks rather than directly from the mills.

The adjustments are also going on in components, although not to such a marked extent as in metals and raw materials. Preliminary reports on STEEL's quarterly survey of components (to appear Oct. 5) indicate stocks are dropping. Most

of the respondents predict even lower inventories in the next few months. For consumer durables, inventories now are probably equal to or slightly above July levels. But watch for them to decline.

"There's an orderliness to these adjustments that I like," says an Ohio executive. "It augurs well for the future."

Good Dividends Continue

Publicly reported corporate cash dividend payments of \$4810 million during the first eight months of 1953 were 4 per cent above the same period last year, the Office of Business Economics says.

Manufacturing payments of \$2439 million showed a rise of only 1 per cent, while nonmanufacturing returns increased 8 per cent. The manufacturing gain was largely in the machinery and transportation equipment industries, which respectively climbed 3.2 per cent and 20 per cent. Higher dividend rates were chiefly responsible for the expansion in both.

During August, dividend payments of \$221 million were 4.5 per cent less than in the same month a year ago. The decline centered in manufacturing where disbursements were 17 per cent less due to the shift forward of many payment dates. Increased railroad checks were the main reason for the 5.5 per cent increase in non-manufacturing.

Push-Button Weather from Heat Pumps

Westinghouse has joined the handful of firms making a unit that both heats and cools. Some 200,000 yearly may be sold by 1960—if the price is under \$2000

YEAR-ROUND air conditioning units may supplant separate cooling and heating installations in favorable climatic areas. So says the air conditioning division of Westinghouse Electric Corp., Pittsburgh, on introducing its new heat pump.

Advantages of the new Westinghouse all-electric heat pump over standard heating and cooling units are that it requires no carbonaceous fuel or water and is more compact. As W. B. Cott, sales manager of the air conditioning division at Hyde Park, Mass., states, "We feel we have developed the most complete year-round air conditioning package yet offered to the public."

New Units—Westinghouse enters the heat pump field with two models, whose production is now beginning. The HP-3 (three horsepower) model occupies ten square feet of floor space, is six feet high and weighs 1400 pounds. HP-5 is a five-horsepower model, proportionately larger than HP-3.

The HP-3 unit has 36,000 btu's per hour capacity for summer cooling, 30,000 btu's per hour capacity for heating in winter, and 1200 cubic feet per minute summer air circulation. Intended for a five or six-room house, it will heat to 70 degrees in winter with an outside temperature of 35 degrees. In summer it will cool to 72 degrees, with an outside temperature of 95 degrees.

Larger Size — The five-hp unit has 60,000 btu's per hour summer cooling capacity and 50,000 btu's per hour warming capacity for winter. Summer air circulation is 2000 cubic feet per minute. This unit is intended for a six to eight-room house, with the same temperature limitations as in the smaller model.

Extremely cold weather, prevailing architecture and prices well above those for the Westinghouse air conditioner alone may limit the heat pump's acceptance. For best results, Westinghouse recom-

mends use in areas where the low temperature range is not extreme nor of long duration.

Cost—Installed price of the two models is \$2300 for HP-3 and about \$3300 for the HP-5 model. Operat-



Westinghouse

HOME HEAT PUMPS

...from ancient heat, modern comfort

ing costs of the new unit are lower than those for any of the ordinary types of cooling equipment, Westinghouse officials say. In tests in an eight-room Lynchburg, Va., house, operational cost for one year averaged \$33.10 per month at the local 1½-cents-per-kilowatt-hour rate. In Miami, Fla., with similar rates, operational cost averaged \$10.50 per month. Here, cooling was the prime requisite.

The self-contained heat pump fits best in the basement or utility room. Installation consists of connecting electric power lines, a condensate drain and supply and return air ducts. Westinghouse expects most sales to be in new installations, with renovation of existing ductwork advisable only in bungalow-type houses, says Mr. Cott. In one-story houses, ductwork can be installed easily below the roof or below the floor.

Automatic Operation—"One rea-

son for successful operation of the heat pump," Mr. Cott says, "is its original design of a new single metering tube. This automatically switches the unit from heating to cooling."

A single three-stage room thermostat regulates the pumps. There is a five-degree differential between the heating and cooling stage and a two-degree differential between normal heating and the booster heat stage. A thermostat set at 74 degrees would control the heating stage at this temperature. Booster heat would come on at 72 degrees and cooling would begin at 79 degrees.

Experimental—Because of the cost and commercial youthfulness of the heat pump, not many companies are yet in the field. Westinghouse has just gone into commercial production. General Electric Co. has been marketing packaged home units since early in 1952. A few other firms, including Typhoon Air Conditioning Co. Inc., Brooklyn, N. Y.; Muncie Gear Works Inc., Muncie, Ind.; and Acme Industries Inc., Jackson, Mich., also produce the packaged unit. Other companies, such as Trane Co., La Crosse, Wis., build it into custom installations.

GE Vice President Clarence H. Linder predicts that 200,000 packaged heat pumps will be sold annually by 1960 at an average installed price of less than \$2000.

Something New in Plows

American and Canadian manufacturers interested in the revolutionary new bulldozer plow developed and now in production in Norway will have a chance to see this machine in action at the International Plowing Match and Farm Machinery Demonstration to be held Oct. 6-9 at Cobourg, Ontario.

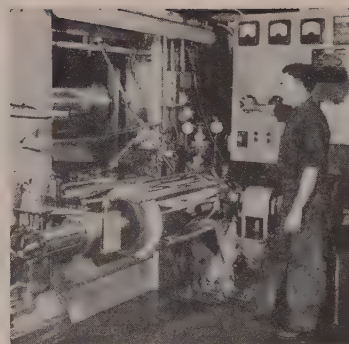
Attached to the front of a 15-ton bulldozer, the plow digs furrows 3 feet wide and over 2 feet deep in rocky virgin soil. "Large boulders, caught by sharp prongs made of armor steel, are brought to the surface with the greatest of ease," reports the Norwegian Information Service, Washington. After the demonstration, the codesigner, Ragnvald Skjarpe, plans to visit agricultural implement builders in Minneapolis and Chicago.



Inspecting aluminum foil

Future Glitters For Metal Foil

Metal foil, and today that means mostly aluminum foil, is bounding ahead with high output and new applications



Rolling aluminum foil

MANY METALWORKING products are now going into the battle for sales in a shining coat of protective armor—metal foil.

Until World War II, foil was considered the nearly exclusive property of the food packaging industry. And a growing host of food products are being packaged that way: Candy, gum, butter, cheese, frozen foods, and cereals, not to mention other products like cigarettes, cigars, even complete full-course dinners — precooked and merely warmed up when ready for use.

Discovery—But, in World War II, metalworking manufacturers discovered metal foil for their own products as foil was written into military packaging specs. Now, engines, bearings and replacement parts are going to the commercial market in very thin coats of metal.

Aluminum foil leads by a wide margin of usage over combination lead-tin and tin foils. The ratio is probably 70-20-10. This year, aluminum foil output will exceed the 100-million-pound mark, up nearly 15 million pounds from 1952's 85,402,000 pounds. Aluminum Association members, representing more than 90 per cent of total aluminum foil output, turned out 55,702,000 pounds of foil in the first half, 1953. In addition, some 8 or 9 million pounds are produced annually by nonmembers, including some tobacco companies.

Wrap It Up—That's big production when you consider one pound of aluminum foil of 0.0005-inch thickness will cover an area of 142 square feet. The most commonly used gages for packaging run from 0.0015-in. to 0.00035-in.

Lead and tin foils are used largely in special fields where the na-

ture of the produce packaged requires protection of those products by lead or tin or where the product is allergic to aluminum. Johnson Foil Co., St. Louis, makes a solder foil, a combination of lead and tin, which is used in electrical equipment. A layer of foil is laid down between two parts and, when heat is applied, a quick, evenly soldered joint results.

Pace Setter—But in most markets, aluminum foil has taken the pace-setting position because it's cheaper by the time it reaches the end-product and it is becoming increasingly available.

Though packaging takes the lion's share of output now, usage of aluminum foil is in the process of metamorphosis into a manufacturing material. Conditions for the change have been growing since industry really got its hands on the skinny, shiny, stuff during World War II. Metalworking has become educated to aluminum foil's properties. It's a moisture barrier. It's greaseproof, nonsorptive, shrinkproof, corrosion resistant, nonaging and strong. It reflects radiant heat, yet passes direct heat rapidly. It's an electrical conductor. It can be lacquered, laminated, printed upon, embossed and readily formed. Colored aluminum foil can be drawn without marring. Together with this process of education has been increased production of aluminum foil and better accessibility.

Drawing Nearer—While there are still relatively few basic producers of foil, there's a growing number of "converters" in the country, possibly a double handful now, and both types of producers are stepping up production goals. That 55.7-million-pound

output in the first half of this year, for example, represents a 52 per cent increase over last year's first half production.

What changes are these conditions bringing in aluminum foil usage? The bright metal is turning up in all sorts of new industrial applications: As lithographic printing plates, as gage needles, as roofing and wall insulation, as capacitors and diaphragms in radios and TV, in appliances, hospital equipment, as gaskets and shims and in dies for certain plastic-forming operations. Even the possibilities of more aluminum being used in automobiles are partially based on foil applications.

With more industrial applications like those above appearing literally every week, there's no reason to ask what has put the glitter in industry's eye—it's aluminum foil.

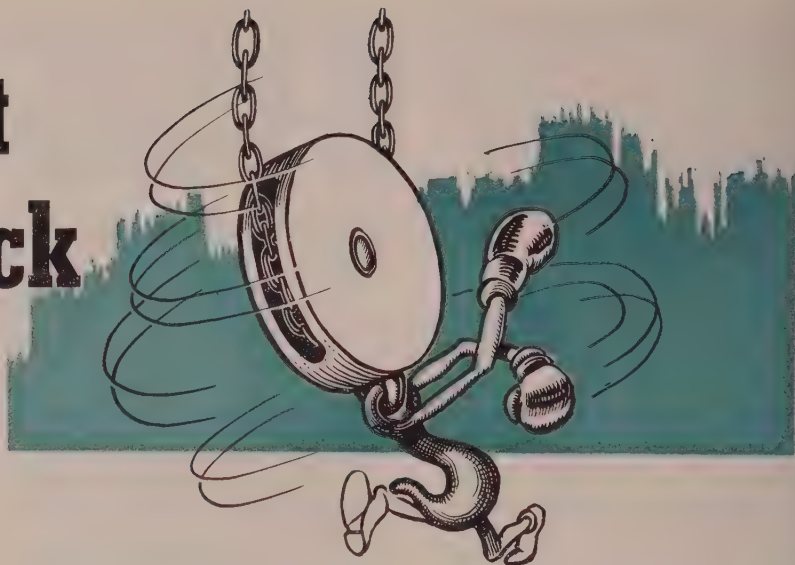
Jeeps Made in Japan

Some Willys Jeeps may soon be marked "Made in Japan," following an agreement between Willys-Overland Export Corp. and Mitsubishi Heavy Industries Reorganized Ltd.

Hickman Price Jr., president of the Willys export company, says, "The new agreement provides for progressive manufacture. Mitsubishi will rapidly develop the manufacture of its own parts to Willys' specification and is expected to reach 100 per cent Japanese material content in the near future."

Mitsubishi is establishing the manufacture of Willys Jeeps in its Nagoya plant about 175 miles from Tokyo. This plant, largest and most modern in the Orient according to Willys, has a floor space of 3,246,000 square feet.

Ohio Hoist Fights Back



WHAT SHOULD a small company do when faced by unreasonable demands from its union, a large international?

Ohio Hoist & Mfg. Co., Cleveland and Lisbon, O., encountered that problem. Here is a case study of what its management is going through to fight its way out of a corner. The situation is not uncommon; many other firms, mostly small, have been in the same predicament.

The Genesis—Ohio Hoist is a small company manufacturing hoists and other materials handling equipment. It's a young company which had operated at a loss as of last April. About that time seven of the firm's nine employees voted to organize, selecting the AFL's International Brotherhood of Blacksmiths, Drop Forgers and Helpers (commonly called the blacksmiths) to represent them.

Shortly after that affiliation the union approached the company, then a partnership headed by James W. Dickey, with a proposed contract containing many demands. All the terms were discussed. On many points both sides were in agreement. But many economic demands eventually made by the union were termed "fantastic" by management. It was explained that the company had been operating at a loss, but that prospects for future earnings, based on newly acquired contracts, were bright. Despite the attempted negotiations by management, the union refused to yield, and subsequent to Apr. 25, an impasse was reached between management and labor.

What To Do?—Mr. Dickey reports that one union official said: "If the firm cannot afford to pay

higher wages, then it should close—it does not deserve to be in business." The partners decided that their economic situation was such that they should stop operations rather than undergo a strike.

That might have been the end of the whole story, had it not been for civic leaders of Lisbon who urged the partners to reconsider their action and to keep a potentially prosperous business in the area. The partners did reconsider, and as a result, formed a new corporation, Ohio Hoist & Mfg. Co. Inc. The new corporation took over the assets of the old firm and reopened the Lisbon plant May 5. Reese Lewis, a former associate, was made president.

New Concept—The old Ohio Hoist had been primarily an assembly operation, with much of its work subcontracted. The new Ohio Hoist decided to do more of its own work and actually to become a manufacturer.

For a while after it reorganized, Ohio Hoist heard nothing from the union. But on May 28 that group lodged a charge with the National Labor Relations Board, saying Ohio Hoist refused to bargain, locked out illegally and was discriminatory. NLRB assigned the labor charge to its Sixth District (Cleveland) for investigation.

Timetable—In the meantime, on June 3, 11 of the 13 employees the company had at that time signed this petition: "We, the employees of Ohio Hoist & Mfg. Co.

Inc., wish to have the International Brotherhood of Blacksmiths, Drop Forgers and Helpers (AFL) discontinue negotiating a union contract with this company."

After that development, the NLRB investigation began. The company objected to the way it had been conducted and reported it as "biased" to the labor board. A new examination was requested by the company. NLRB acknowledged the company charge, but the regional office stated that it believed the investigation to be fair and that it would make no further examination. A complaint was issued early in September based on that investigation.

Paradox—In the meantime—to complicate matters still further—the International Brotherhood of Boilermakers (AFL) advised the NLRB of its amalgamation with the original blacksmith union. The boilermakers were recognized by NLRB as the new bargaining agent. Thus, the situation now is that the principals in the dispute, the company and the union, are both different parties than when the whole thing started.

The new Ohio Hoist has had a face-to-face parley with the union; on July 25, both sides met but got nowhere. The company has been advised that legally it no longer need deal with the union, since the majority of its employees petitioned June 3 to have a non-union plant.

More To Come—But the dispute

is not over yet, because in October an NLRB examiner from Washington will hear the case, and then the national board will decide on whether Ohio Hoist has refused to bargain, locked out illegally or was discriminatory. The company believes it has a strong legal case.

In its economic battle, too, Ohio Hoist has more than held its own. It has jumped from nine employees in April to 53 now. And its order backlog is substantial. Company officials say: "We've discovered one thing in all this—it pays to assert an honest position."

Coal: The Decline Is Serious

Reeling from a better than 28 per cent production drop in the past six years, the coal industry—particularly in the South—is struggling to find a solution to check its market decline.

Joseph E. Moody, president, Southern Coal Producers' Association, recently outlined six steps which he believes necessary to get the industry out of its doldrums.

The Drop—Coal production, he related, has dropped from 630 millions tons in 1947 to an estimated 450 million tons this year. The market loss has come principally from railroads, heavy industry including electric utilities and home heating because of the inroads made by diesel oil, residual fuel oil and natural gas.

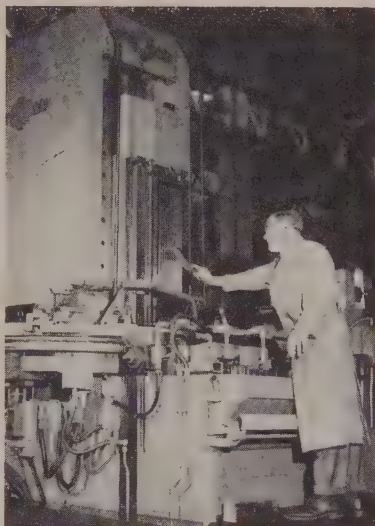
The Appeal—Calling upon all coal users, mine operators, miners, Congress and all concerned federal agencies to join in the effort to help the industry gain an economical footing again, Mr. Moody outlined the following program:

1. Stop cut rate dumping of foreign residual fuel oil.
2. Restrict use of natural gas to fields for which it is best suited and declare pipe lines common carriers.
3. Reduce exorbitant freight rates of coal, particularly in distant-to-market Southern mines.
4. Work out a program to reduce the per-ton cost of mining Southern coal.
5. Set up better research programs to find better means of coal utilization as well as new uses.
6. Bring to the attention of Congress the unequal depletion allowance provision of the tax law and press for a revision.

Equipment Disposal Policy Coming

The U. S. will soon outline its program for disposing of idle defense production equipment. Machine tool builders are fearful of some phases of the plan

BUILDERS of machine tools and related industrial equipment can abandon fears that they may be hurt by disposal of such government-owned capital goods, says



GOVERNMENT-OWNED TOOLS
... where do they go next?

Defense Mobilizer Arthur S. Fleming.

Machine tool builders, themselves, are not quite so hopeful. They believe the present administration will manage the disposal program wisely so as not to hurt manufacturers, but they fear what some new administration might do with the program.

Details Coming—Dr. Fleming says that Office of Defense Mobilization will issue a statement "within a week or ten days" to formalize the policy as to leasing and disposing of equipment. The policy would be based on the premise that to build up mobilization readiness defense production facilities must be kept intact so that they could be used without delay. A fundamental requirement is that the "packages" of equipment in defense plants must be kept complete. Hence, leasing of government-owned equipment for non-defense production will be permitted only in exceptional cases.

The forthcoming policy statement will define the circumstances under which such exceptions may be allowed. That aspect of the disposal program is the most touchy. Tool builders say that past history shows that exceptions often come to be the rule.

What About Sales?—As to disposal of machine tools and related equipment by sales, says Dr. Fleming, there will be such sales only if and when existing defense production lines become obsolete or if and when equipment clearly will be needed no longer. Such cases, he believes, will be even more rare than leasing. He claims the total volume leased or sold will be negligible.

Cutbacks in truck, tank, aircraft and ammunition production will not reduce the size of the mobilization base. All defense production facilities will be kept in standby. That applies not only to plants and facilities of prime contractors but also to those of subcontractors and sub-subcontractors. Ways and means of carrying out that program are being studied.

No Single Source—Dr. Fleming said that a careful investigation by him reveals no evidence of a trend towards a single source policy in the Department of Defense. There is a trend, he said to cut back on the number of sources for a particular item but this is accomplished by consideration for the necessity of keeping all sources available for use in case of need.

GM, Reo Share Army Contracts

General Motors Corp. has been awarded exclusively the Army's \$200-million contract for the building of M48 medium gun tanks. It and Reo Motors Corp. will share in the Army's \$146 million worth of awards for the production of two and one-half ton trucks during the latest contract period.

Chrysler Corp., which developed the Patton tank in conjunction

with Army Ordnance, did not receive that contract. General Motors did since its bid was 12 per cent lower. General Motors and Chrysler, the present contractors, will continue building these tanks until April, 1954, when Chrysler will place its machine tools in package storage adjacent to its Newark, Del., plant. Under a separate contract, Chrysler will remain as a vehicle design agency for the tank.

Although the bid of Reo Motors for the two and one-half ton trucks was slightly higher than GM's, Reo received an award which totaled \$61 million. Studebaker, the only other present contractor, will finish its truck work before the end of the year.

Now, Iron from Nickel Ore

International Nickel Co. of Canada Ltd., announces construction plans on a \$16-million plant to be the first operation to recover iron ore as a by-product from nickel ore under a new process.

The plant will be near Copper Cliff, Ont., and the first unit in an operation which will ultimately yield about a million tons of high-grade ore a year, in addition to nickel, from Sudbury ores.

Sales Dip, but No Tears

Despite a slight drop in machine tool sales, distributors see no cause for general pessimism

MACHINE TOOL SALES have dropped off some, but so far there's no cause for pessimism. That was the general opinion of machine tool dealers at the 29th annual meeting of the American Machine Tool Distributors' Association, White Sulphur Springs, W. Va.

"While our business is below last year's level, there are no signs of a drastic cut. Instead of a slump, it looks to us like a return to a more normal sales atmosphere." So said one midwestern dealer.

Still New Applications—Generally conceded: Heavy sales efforts must be expended on replacement of obsolete equipment. New job areas are still being created at a good clip, however, and most machine tool dealers are submitting a majority of their bids on these new jobs.

Eliot Janeway, consulting economist, highlighted this busy future for machine tools in his address to the group. He said, "Ma-

chine tools will continue to defy gloomy forecasts based on business cycle theories."

Guns and Butter—Mr. Janeway sees the machine tool cycle as one that goes from a gun boom to a butter boom rather than from boom to bust.

Among the signs indicating a continuing healthy atmosphere, Mr. Janeway gives these:

Machine tool customers who have been rationed out of the market are now under competitive pressure to improve product and to lower costs.

Livonia fire points up the need for dual source procurement. This will call, in some cases, for four plants producing similar products. Two will produce for civilian items and two for defense.

Favorable outlook for depreciation allowances plus discouraging outlook for tax allowances will work as a couple to keep machine tool demand high.

Russia's known ability to penetrate North America will result in more diversification of industry and facilities.

Much of the money spent thus far on the armament program has gone for research and development. More must be spent on the actual production of these defense items.

A backlog of new defense demand has accumulated and will probably show before too late in 1954.

Cleveland Foundry Sold

Controlling interest in the Lake City Malleable Co., Cleveland, has been purchased by the Machinery Terminals Inc., Akron, Sydney L. Albert, president of Machinery Terminals, announces. Purchase price which included the Columbus and Ashtabula plants of the company was "above \$2 million."

New Steel Firm Organized

Formation of World Steel Corp. which plans to build a plant in the Chicago area for the manufacture of steel sheets is disclosed by Peter S. Pedersen, Chicago, president. The company has been incorporated in Delaware and has been qualified to do business in Illinois.



Mexican Beauty from American Design

Inherent beauty of steel structures shows up dramatically in an all-welded steel bridge spanning the Rio Blanco river near Vera Cruz, Mexico. The graceful "basket-handle" design, conceived by Dr. Thomas C. Kavanagh, chairman of New York University's civil engineering department, won an award in the 1951 professional bridge design competition sponsored by the Lincoln Arc Welding Foundation, Cleveland. The bridge was constructed by Mexican engineer Camilo Piccone. Fabricator was Estructuras, S. de R.L., Monterrey, Mexico

Economy Pays Plane Industry Dividend

How are your cost-cutting measures doing? Here are some the Aircraft Industries Association has adopted which amount to several million dollars in savings annually

BIGGER BAG of groceries for buck. The aircraft industry, like all of us trying to get more value from our dollars, is working on an economy program which is paying top-flight dividends for its procurement dollar.

The program, outlined in a booklet just released by the Aircraft Industries Association, delves into all phases for its economy measures—management, engineering, tooling, actual manufacture and materials.

Blood Pressure—Because most of the industry's production is in military craft, its lifeblood depends upon such action in response to national pressures to provide the best aircraft in the world and to do the job with the least possible tax-dollar cost. The task facing the industry can readily be seen when comparing the \$58,000 cost of a World War II fighter with today's \$233,000 craft and the \$660,000 cost of a World War II bomber with today's \$2 million bomber.

Here are the highlights of the AIA's economy program:

Management—Closer co-operation between design, tooling and manufacture is being practiced, members are exchanging more technical and production information within the industry and every employee is being made more cost conscious. The results—one manufacturer reports a saving of \$22 million from its employee suggestion program; another reports 12 per cent increase in labor efficiency and 21 per cent decrease in overhead rates since 1941.

Engineering—Standardization and interchangeability of parts, long pushed for by the component makers, is being adopted; design is stressing minimum weight, simplicity, easier production and economical operation; technical information is rapidly disseminated to plant personnel and more emphasis is being placed on employee training programs. Savings cited include the standardization of a terminal panel for all fighter planes

which saves about \$190,000 annually, simplification of a bomb hoist that saved 84 per cent of its production cost and the use of an electric computer that reduced engineering time on a typical landing gear by 85 per cent.

Tooling—Here centralized management has been adopted; tools are designed for multiple use, made of the most economical materials possible and where possible made on an assembly line. On a 200-airframe contract a savings of \$100,000 was made by the development and use of curved jaws in a stretch forming press. By putting construction of hydraulic stretch press dies on a production line one company hiked die output per worker by 72.7 per cent.

Manufacturing and Factory—Statistical quality control, breakdown of major assemblies, better use of space, simplification of paper work and better preventive maintenance are factors in this phase. Simplified forms saves one firm \$100,000 per year, a new multiple drill press provides a savings of 99.5 per cent of machine time and one firm saved 10,000 man-hours per year by statistical quality control in sheet metal inspection.

Materials—The highlights here include co-ordinating purchases for most economical quantities, stimulating competition, checking waste and setting up reclamation programs. One manufacturer reports a saving of \$1.5 million in one year through reclamation.

Four basic factors are pressing the need for economy measures not only in the military aircraft industry, but in most others as well. 1. Inflation has reduced the buying power of the dollar to half that of 1941. 2. Present day orders for aircraft are considerably less than during wartime, making the unit cost higher. Loss or reduced defense orders may have the same effect on your unit cost too. 3. Technical changes in equipment are costly but must be



NPA Components Head

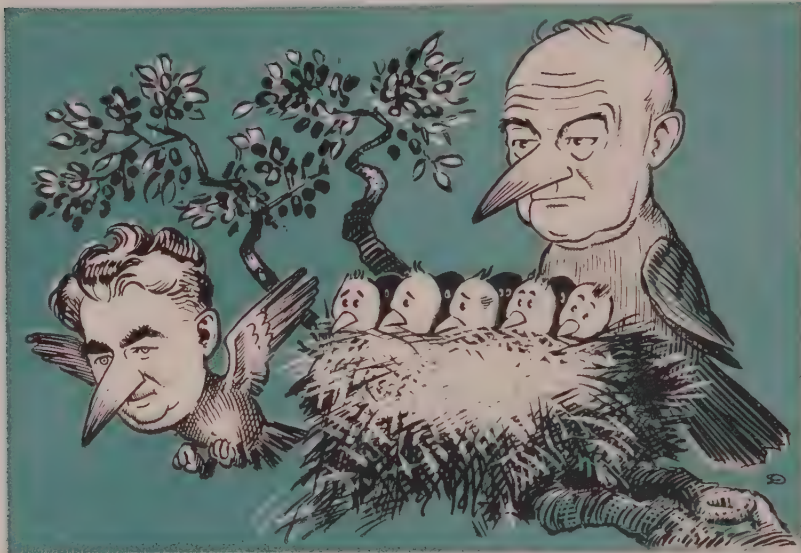
New director of NPA's General Components Division is Victor A. Spoehr, on leave from his post of vice president and general manager of M. H. Harper Co., Morton Grove, Illinois

made to keep pace with other scientific and engineering discoveries. Your product may not have the large number of changes being made in aircraft, but it is nevertheless an important cost. 4. Greater superiority of products today tends to boost costs. Your equipment is probably doing a better job just as airplanes are flying faster and higher than ever before, but the improvements and additional equipment necessary to accomplish it are costly.

SDPA Summarizes Aid

In spite of more than \$723 million worth of assistance during the lifetime of the Small Defense Plants Administration, small business did not fare as well as larger companies after Korean hostilities began, according to SDPA's final quarterly report.

This summary, issued by William D. Mitchell, chief of the recently created Small Business Administration, states that, in spite of aid representing the total dollar value of contracts procured from the government and loans obtained through the agency's efforts, small producers gained less than 25 per cent while net sales of the bigger firms shot up 40 per cent through 1952.



The first bird leaves the nest . . .

Martin Durkin's resignation as secretary of Labor may spark showdown in Taft-Hartley controversy. Issue promises plenty of powder for '54 election battles

WATCH for the long-overdue showdown in the controversy over the fate of Taft-Hartley Act now that Martin P. Durkin has resigned as secretary of Labor. Both the administration and Republican majority in Congress can be expected to act in the knowledge that labor legislation will be a key issue in the 1954 election campaigns.

The issue will lie between retaining and amplifying the T-H law's protections to the public and the strengthening of powers of the union leaders. President Eisenhower revealed which side he'll be on when he refused to accept the union amendments proposed by Mr. Durkin.

Power Proposals—The Durkin proposals rejected by President Eisenhower would strengthen the powers of union leaders immeasurably—particularly in the latitude that would be allowed in the proposed legislation. It would have broadened the use of union hiring halls, eliminated mandatory injunctions against secondary boycotts, permitted secondary boycotts in the construction field,

declassified much supervisory personnel now classified as supervisors, allowed the union shop throughout the construction industry, shortened the contract termination notice period from 60 to 30 days, eliminated the loss-of-status penalty for striking during that period and eliminated the provision authorizing state right-to-work laws so as to make the federal law paramount.

While the President has not explained his position in detail it can be assumed from the speed which he accepted the Durkin resignation—particularly from the finality of his critical half-hour interview with Mr. Durkin in which he accepted the resignation—that he felt himself unable to buy the proposals in toto.

More of the Same?—As to Congress, it is recalled that despite all the hue and cry and the months of work put in by the two labor committees there was an unwillingness in 1953 to eliminate the public safeguards in the Taft-Hartley Act. Some legislators predict that this attitude will be even more pronounced in 1954 in

view of the refusal of the labor leaders to play if they can't have their way.

Administration supporters in Washington believe that adroit and honest handling of the issue will win votes among union rank-and-filers in 1954 despite opposition by labor leaders. They point out the big labor vote piled up by the late Senator Taft in 1952 in the face of militant opposition from the labor czars. The administration is left with some strong cards. The important thing is to play them right.

Union Hearings Set . . .

Hearings on "Communist penetration of our trade unions," according to Sen. John M. Butler (Rep., Md.), will begin about Nov. 1. Senator Butler is chairman of a task force of the Senate Government Operations Internal Security Subcommittee, which proposes to investigate the CIO-expelled United Electrical, Radio and Machine Workers of America, the International Union of Mine, Mill and Smelter Workers, the American Communications Association and others. The latter union, recently certified by the National Labor Relations Board as the exclusive collective bargaining agent for 50,000 Western Union telegraph operators, is described by Senator Butler as a "Communist-controlled labor organization."

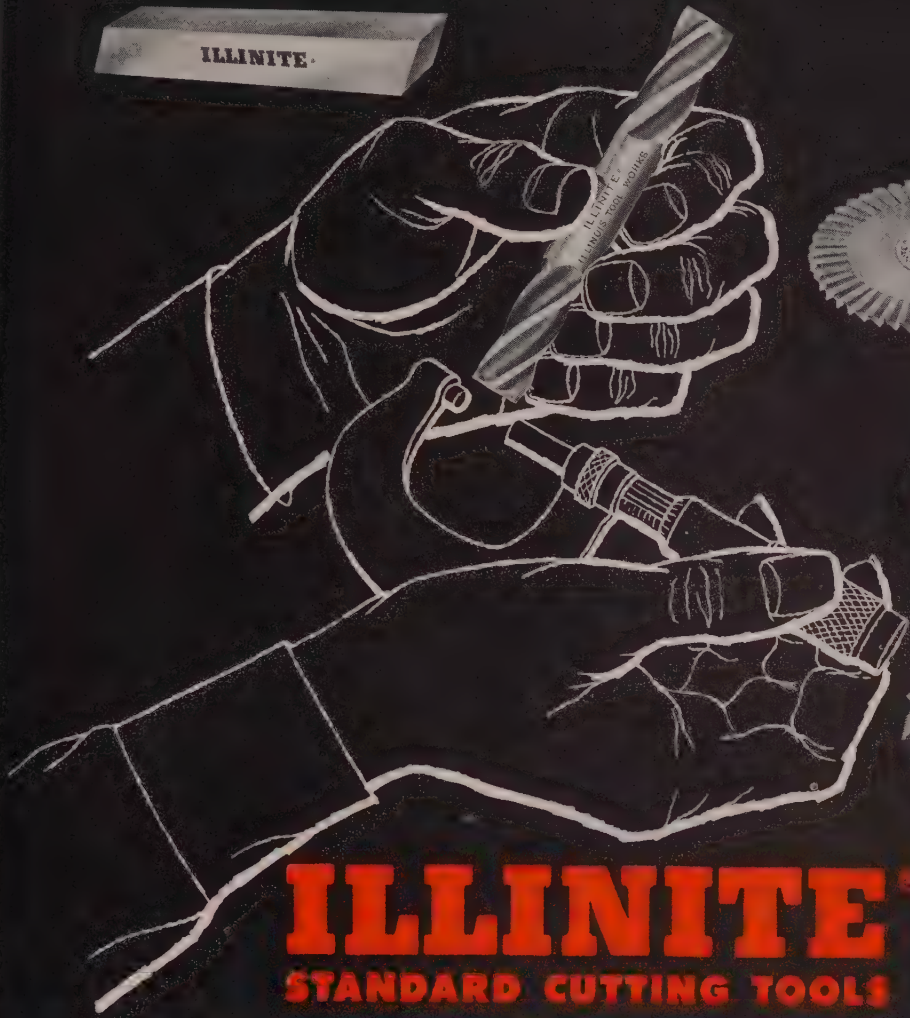
More Economy Efforts . . .

Part of the Eisenhower administration's economy plan is to end the old custom of performing many government services free or on a less-than-cost basis. Budget Director Joseph M. Dodge has ordered all federal agencies to review their activities with a view toward ending the "give-aways" and placing their services on a paying basis.

Small Business Loan Policy . . .

Small business loan policy of the new Small Business Administration is scheduled for announcement today, Sept. 21.

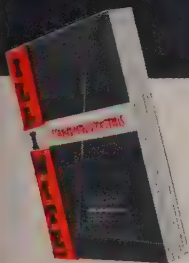
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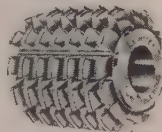
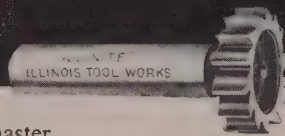
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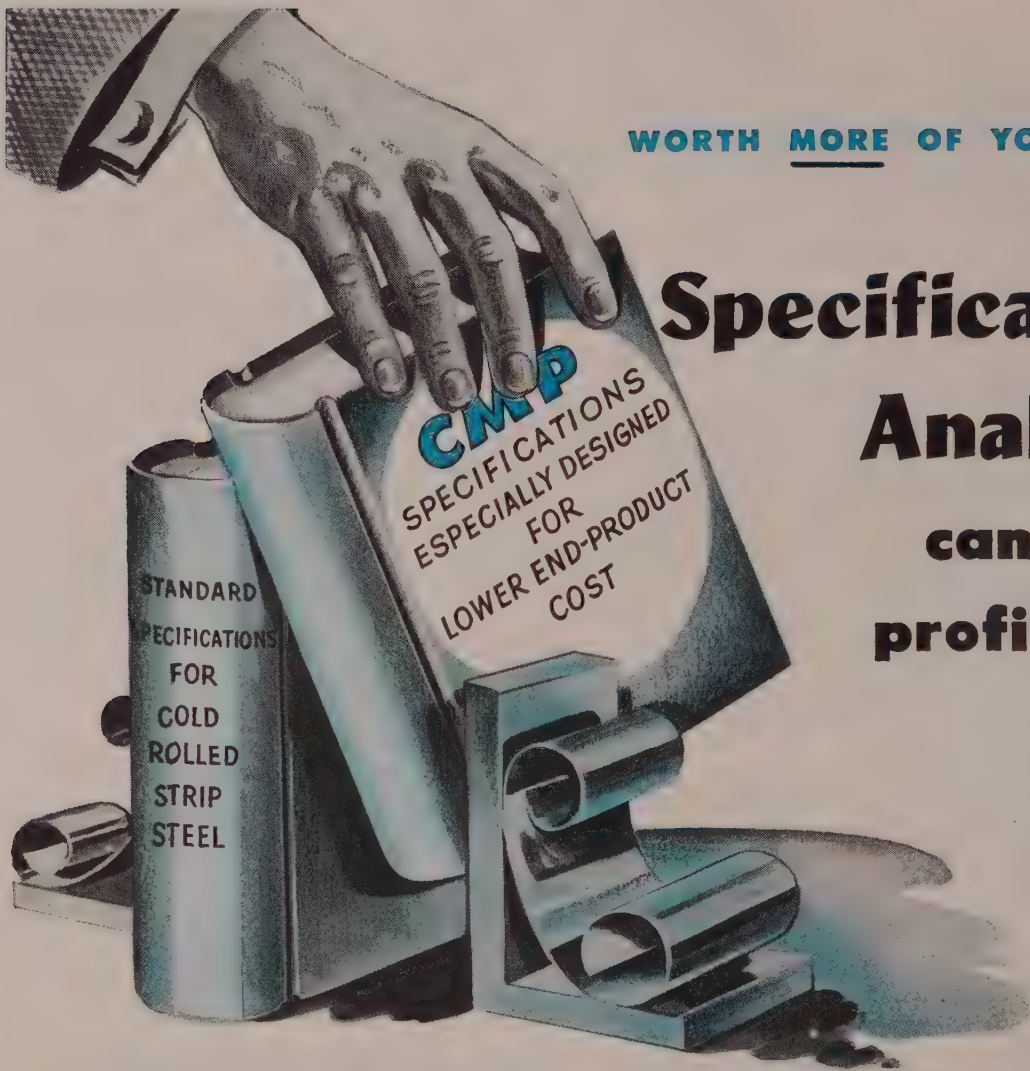


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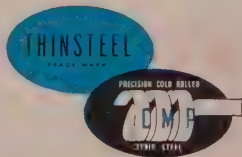
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Underdeveloped Countries Hit Snags

Reports that rapid industrialization would dry up some U. S. overseas markets are exaggerated. Underdeveloped countries are finding the going tougher than expected

INDUSTRIALIZATION indigestion has gripped many underdeveloped countries of the world.

Sobering reports from foreign countries and Americans who deal overseas refute scarey warnings that the U. S. stands to lose overseas markets as potential customers themselves turn into industrial producers. The fact is U. S. metalworking manufacturers will have excellent markets in underdeveloped countries for years to come. Backward countries are hitting snags not apparent in their first rush toward industrialization.

To the Weak—Eugene R. Black, president of the International Bank for Reconstruction & Development, says the most important obstacles to economic growth in the world are not a shortage of capital or timidity of investors or the greediness of big companies, but rather weaknesses and mistakes in underdeveloped countries.

Mr. Black went on to enumerate the weaknesses: Lack of traditions of political responsibility, poor economic initiative, low standards of education and training and insufficient understanding that economic progress requires patience, effort and self-denial.

Robber Industries—Though certainly not alone, Union of South Africa might be pointed out as an example of haste-makes-waste industrialization. The governor of the South African Reserve Bank says the gold mines of the country, main income source, are operating on an average of 80 per cent of capacity. Labor and power shortages arising from the increasing demands of manufacturing industries was cited as one important reason for the low operating figure.

The Human Element—Lack of technical know-how is the main impediment to Pakistan's steel industry, says S. Frederick Magis, steel technologist at Armour Research Foundation, upon his return from a one-year stay there. Other factors, none of which promises to

evaporate overnight, are a lack of trained administrators, obsolete equipment (of the country's 40 mills, only two had equipment that could be salvaged in a redevelopment program), lack of capital, and uneconomical methods of production on which the local steel mill owners must be "unsold."

Underdeveloped countries have made long strides toward industrialization since World War II. But, they're beginning to realize it takes more than aid money to keep industry going.

In the meantime, U. S. manufacturers can look forward to these tremendous overseas markets for metalworking end-products and capital equipment.

A Foreign Report

Christy A. Wilken, vice president of research and engineering, Rockwell Mfg. Co., comes up with these conclusions after a three-

month tour of major industrial cities in European countries:

Leading German machine tool manufacturers have replaced their bombed-out plants and machinery with superior equipment that incorporates latest design ideas, leaving them with the world's best-equipped machine tool plants.

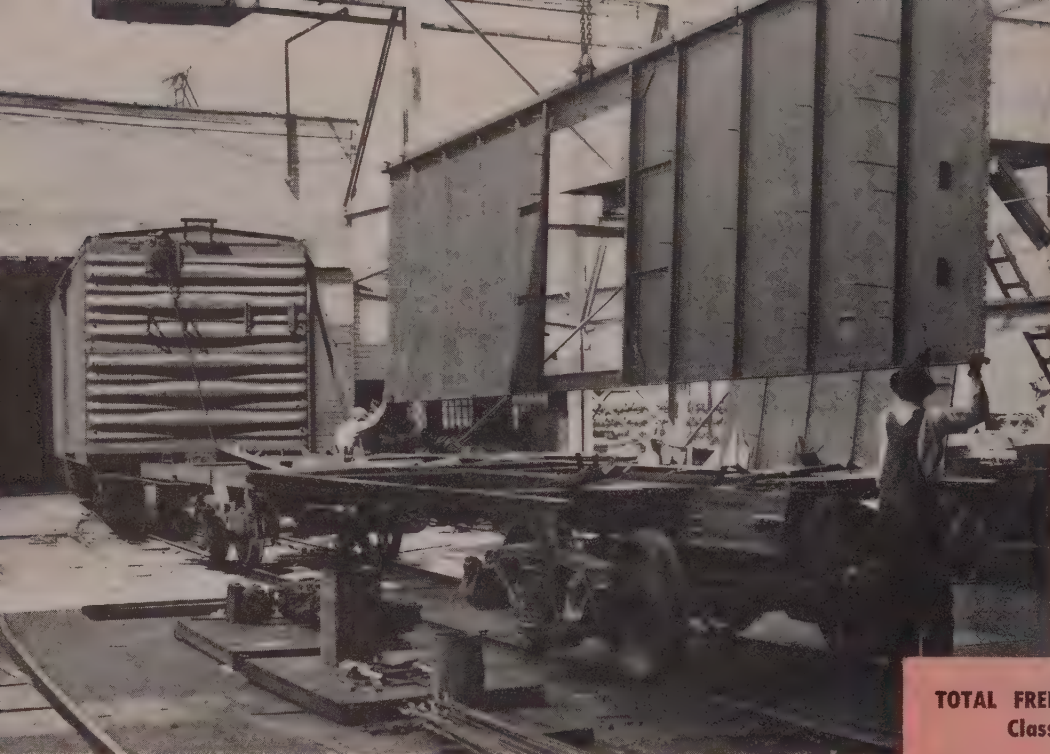
Europe is guaranteeing for itself a permanent reservoir of highly trained machinists and tool experts probably unmatched in this country through its apprentice system. Mr. Wilken found plants everywhere training from 10 to 500 apprentices from 14 to 17 years of age. Apprentices usually train for 3½ years with separate facilities set aside for them. At regular intervals they spend three months in production shops.

Throughout Europe, Mr. Wilken found increased interest in industrial research and a more plentiful supply of scientists and designers to carry it out. Because the salaries of these experts are less than those expected by their American counterparts, he says, American research institutes are beginning to build laboratories abroad where they can better afford "follow-up" projects.



Unusual Crop for a Hungarian Field

First blast furnace of Hungary's Stalin Iron & Steel works was blown in recently. The second blast furnace is expected to be ready in 1954 when four open hearths will also be brought into service. Other facilities at this site include 81 coke ovens, a chemical by-product works, a cement and ceramics factory and a 300-million kwhr power plant



Pacific Car & Foundry

Freight Car Building: Will the U. S. Press For the 1.85-Million Car Goal?

TOTAL FREIGHT CARS OWNED Class I Railroads

Goal Dec. 31, 1954	1,850,000*
Total Aug. 1, 1953	1,769,384
Total Aug. 1, 1952	1,762,558
Total Aug. 1, 1951	1,735,541

* Goal set July, 1950
Source: Association of American Railroads

REDUCED PRESSURE in production of most hard goods items is also being reflected in the nation's freight car building program. Railroad and car building officials look for continued present-level production for the fourth quarter, but they have adopted a "wait and see" attitude for 1954.

New freight car orders bounced up to 3913 in August, the highest for any month this year since January, but ordering is down generally and below current production. The August orders increase was the result primarily of the Erie Railroad Co.'s 1000 freight car order (STEEL, Aug. 24, p. 148).

The Goal—Actual ownership of freight cars is steadily increasing, but few expect the total to reach the 1,850,000 car goal set July, 1950, by the railroads and government for the end of 1954. Class I railroads owned 1,769,384 freight cars on Aug. 1, 1953. This does not include refrigerator cars owned by subsidiaries, which would bring the total to 1,851,429 cars.

In 1949 the total ownership (not

including refrigerator cars) was 1,770,949. With the start of the Korean war, ownership started to drop because car retirement became greater than new car production and the military took cars out of commercial work for its own use.

The New Ones—Deliveries of new freight cars should total over 70,000 this year, according to Association of American Railroads figures. This rate is far below the government's goal of 10,000 new cars per month which it estimated it would need to hit the 1.85-million 1954 mark. The closest industry ever got to the 10,000 mark was in May, 1951, when it delivered 9774 new freight cars.

New car deliveries for the month of August totaled 5557 compared with 6370 in July to bring the year's total to about 47,172. Class I railroads expect to get about 53,000 of the estimated 70,000 freight cars this year. With 5000 cars the normal retirement rate, such a trend would result in a net loss in car ownership at the end of

the year. However, the retirement rate has been reduced and is averaging only 4034 this year so that little change in the number of cars owned by the railroads is expected at year's end.

Steel plate supply has begun to catch up with demand making increased production of freight cars possible, but railroads are not hurrying to place new orders.

Their Age—Most popular cars on order currently are the gondolas and hopper cars, although the box car still remains the most widely used. The average age of today's freight car is nearly 20 years and over 16 per cent have had 30 years of service. Most financing of new cars is done directly through banks or insurance companies.

The pinch if it does come in 1955 will be felt in the commercial shops first, rather than in the railroad shops. For the past five years commercial shops have produced 68 per cent of the new freight cars but production is now approaching the 50-50 mark. During capacity hauling periods railroads keep the

shops busy with repairs, but as the repair jobs drop they build a greater proportion of cars to keep their own shops busy.

Pointed—Pointing up the car building decline is the number of cars on back order. According to the AAR, there were 45,735 freight cars on order and undelivered Sept. 1, 1953, 26,768 with commercial shops and 18,967 with railroad shops, compared to a backlog of 79,514 cars in August, 1952.

The figures do not present too bright an outlook for next year. Commercial shop orders represent a backlog of about four months. For normal one-shift operations to pay off they should have a backlog of about six months and this means new car orders of about 8000 cars per month.

An Estimate—Officials of U. S. Steel Corp., which is a large producer of steel for car building, predict that an average of 5000 cars per month will be built in 1954 with the top month totaling about 7000. They also predict 80,000 cars will be retired. Net gain will be little.

The car building picture, however, is causing no more concern than is generally being experienced by other industries during the current adjustment. Watch for more government pressure to meet the 1.85 million freight car goal to keep pace with the defense program. That many cars would be needed to take care of civilian and military needs during full mobilization.

Transport Big Steel Consumer

"One-third of all steel that will be consumed in the United States during 1953 will go directly into equipment for transportation," remarked Clifford F. Hood, president of U. S. Steel Corp., at a Pittsburgh dinner of the American Society of Traffic & Transportation Inc.

"Out of a safely predictable total of better than 76 million tons of finished steel this year, an estimated 24.9 million tons will go into transportation," Mr. Hood continued. "Estimates show that the auto industry will consume 14 million tons of steel; the railroads 5.5 million; pipeline constructors 3 million; highway builders 1.5 million; shipbuilders 700,000 and aircraft builders 200,000 tons."

Film Beckons Tool And Die Apprentices

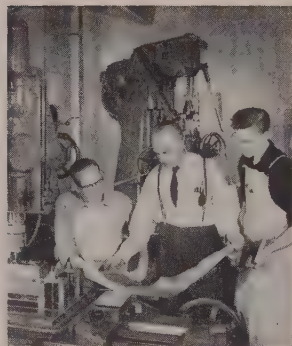
NTDMA makes its bid to help lick the apprentice shortage with a motion picture just released

APPRENTICE SHORTAGE talk has brought action from the National Tool and Die Manufacturers Association in the form of a motion picture, "Tool and Die Making—Keystone of Mass Production."

Shown for the first time on Sept. 15, the 16-mm color and sound film has as one of its aims the encouragement of young men with mechanical aptitude to become tool and die apprentices by informing industry, government and the general public of the nature of contract tool and die making.

The film follows the progress of an apprentice through the 8000-hour course leading to journeyman status. It shows him learning by doing—operating machines, studying blueprint reading, shop mathematics and shop theory and learning complex techniques. The photographs shown here are scenes taken from the film. Sequences were filmed at tool and die shops

Scenes from the NTDMA movie, "Tool and Die Making—Keystone of Mass Production": Above, blueprint reading, shop mathematics and machinery operation are skills the apprentice must master. Below: as the apprentice nears journeyman status, operation of precise tools becomes second nature



The tool and die apprentice spends much of his time in actual shop work. Early in the 8000-hour apprentice course he learns to use basic machines of his craft, like this lathe

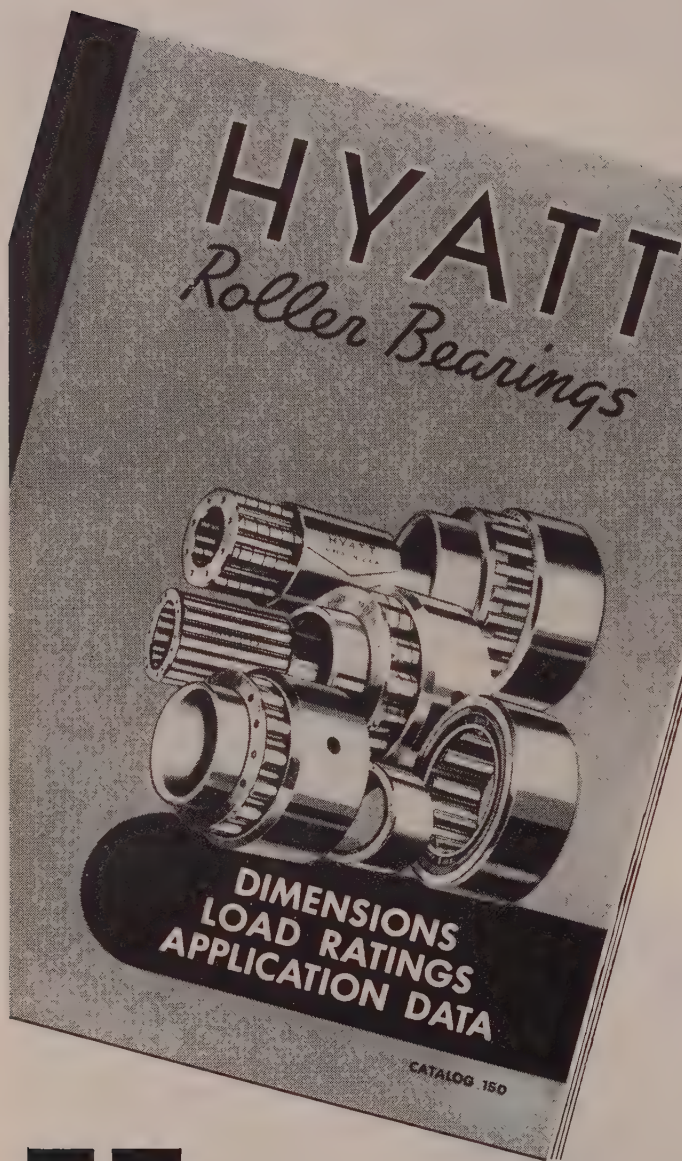
and manufacturing plants in the East and Midwest.

Examples of toolmaking practices in the manufacture of such diverse items as zippers and automobile crankshafts give a practical punch to the picture and serve to point up the toolmaker's constant emphasis on accuracy.

Emphasized also are the educational advantages, the "earn-while-you-learn" feature of apprenticeship and the position of respect and high pay held by the journeyman tool and die maker.

Showings of the film will be held in the twenty-three centers of the National Tool and Die Manufacturers throughout the country. Prints are available for loan or purchase through the association's offices, 907 Public Square Building, Cleveland 13, Ohio.

**The answer to any
bearing problem...**

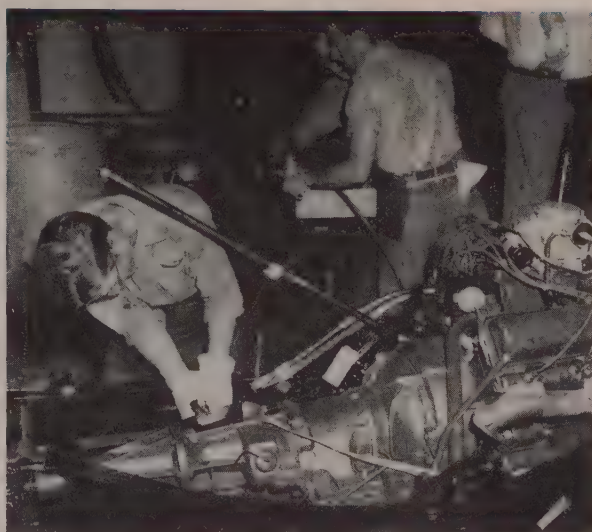
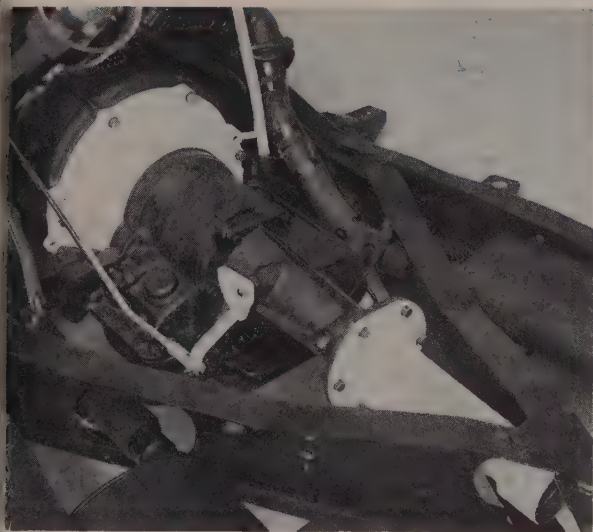


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right
at
your
fingertips!**

... because you'll find all the right answer in a Hyatt catalog. Hyatt's complete line of cylindrical roller bearings—more than 800 sizes in the Hy-Load series alone—makes your job easier, because it makes possible greater design flexibility. And in addition, when you specify Hyatt bearings you know you're getting the very best! If your file of Hyatt catalogs is incomplete, contact one of Hyatt's sales-engineers—or write to Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT **ROLLER BEARINGS**

Mirrors of Motordom



Fast work, new parts (in white, left) adapt Cadillac engines for Dynaflow . . .

Just 27 days after Livonia, Cadillac rolled its first Dynaflow-equipped car off the line. Here are the engineering story and first road-test report on the car

DETROIT

THERE'S a new saying in the Motor City—"When better Buicks are built, Oldsmobile and Cadillac will build them."

This remark, to an outsider at least, contains a certain amount of humor. But since Cadillac and Oldsmobile adopted Dynaflow following the cutoff of Hydra-Matic output by the Livonia fire, there have been opportunistic remarks by competitor companies more malicious than humorous.

Not Brand Conscious—Transmissions generally are not brand-conscious. They absorb the torque input of the engine and deliver output torque to the rear wheels. But the input and output limitations of a transmission are carefully studied before it ever goes into production. If the engine output and drive load translate into torque demands which fall within the rated limitations of the transmission, the basic requirements for good service are satisfied.

This was the rudimentary information with which Cadillac engineers began to work on Thursday morning, Aug. 13. By three o'clock that afternoon, less than 24 hours

after the start of the Livonia fire, engineers had made their basic decision: It could be done. The next question was whether or not Buick could supply the transmissions. A trip to Flint the next day assured Cadillac of Buick technical and production assistance on the project and Cadillac began to go for production.

Fast Work—The first step was to build a production prototype. Engineers began the first installation Friday night. By Sunday evening the installation was finished, complete with new castings poured from wooden patterns. On Monday morning the car was demonstrated to management and the basic installation was approved. Now translation of the prototype to production began, even as the prototype itself began engineering tests.

To adapt the torque converter to the Cadillac cylinder block, a completely new flywheel housing, rear bearing retainer casting, rear bearing retainer extension and lower bell housing had to be cast. The wooden patterns of the prototype were flown to Omaha, Neb., to be translated into steel for production. The converter pump cover re-

quired a shorter hub to nestle into the Cadillac crankshaft. A new flywheel starter ring gear and machining changes in the cylinder block required alterations in existing machines and tooling. All were quickly supplied.

Modifications—Other new parts include a redesigned bracket to relocate the transmission oil cooler, a new rear engine support bracket, a new transmission shift control linkage, a new shift control stop plate and a new selector position dial. The Cadillac twin exhaust pipes are bent outward in new jigs to accommodate the greater breadth of the torque converter unit. A dash pot is added to the carburetor to damp throttle closing and the carburetor is recalibrated. To complete the adaptation, the formerly optional 3.36:1 rear axle ratio is incorporated, giving an increase over the 3.07:1 now standard with Hydra-Matic.

Just 11 days after the decision was made to go for production on Dynaflow and only eight days after the prototype was completed, the first car with all-production parts was finished. The rapidity and extent of the changes comprise a unique accomplishment in automotive annals.

No Make-shift—Some of the major components which have been changed and the first production-

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line Dynaflo installations are shown in the accompanying photographs. It is apparent that despite the speed and extensiveness of the changes, the Dynaflo-equipped Cadillac is a production automobile in every sense of the word and not an expedient. Accelerated engineering tests and deliberate overstrengthening at possible failure points indicate that the cars will prove dependable.

And how does it feel to drive a Cadillac equipped with Dynaflo? A recent test-drive of one of the first three Cadillacs equipped with production Dynaflo reveals that the car has definitely not transmuted into a Buick. It is still very much a Cadillac, but the sensation is different and definitely pleasant. The surge of power is smooth since there is no upshifting with Dynaflo. By the same token, initial takeoff suffers without the Hydra-Matic torque multiplication but not objectionably. Passing acceleration in the 40-70 mph range remains excellent.

In Some Ways Better—Perhaps you will recall in our driver reaction to the Cadillac we reported (STEEL, June 29, p. 62) "a peculiar characteristic in acceleration from about 20 mph. At this speed third gear is rather sluggish while the downshift to second is accompanied with plenty of go but an annoying jerk as the gear cuts in." That condition is eliminated with the shift-less Dynaflo.

Whether you prefer smoothness or performance is a matter of opinion. Hydra-Matic epitomizes performance and Dynaflo is as smooth as they come. The Cadillac engine whips that Dynaflo juice in a way it's never been whipped before and in our book the addition of Dynaflo to the Cadillac is no impairment.

Cadillac engineers aren't denying that they're pleased with the results, and if enough people feel the same way it's quite possible that Dynaflo will become a listed option on the "Standard of the World."

Other High Dramatics

The five remaining makes of cars hit by the transmission cutoff were beginning to get power to their rear wheel to start moving last week. Oldsmobile rolled

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	526,134
August	641,242	322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509
Week Ended	1953	1952
Aug. 15	156,526	36,890
Aug. 22	163,635	109,588
Aug. 29	152,866	122,659
Sept. 5	132,574	111,095
Sept. 12	122,497	137,295
Sept. 19	125,000*	142,494

Sources: Ward's Automotive Reports.
*Estimated by STEEL.

its first score of Dynaflo-equipped cars off the Lansing assembly line Sept. 2 and is supplementing output with Syncromesh cars for a total of 550-600 cars daily. This output is near capacity for the Lansing operation, but the Buick-Oldsmobile-Pontiac plants are still hit by the Hydra-Matic curtailment.

Hudson is reported to have concluded arrangements for up to 4000 Borg-Warner units monthly. With Studebaker halting production to allow dealers to dispose of inventories, it appears that Hudson will get its full quota for some time. Available Hydra-Matics were used to get 1954 models now being produced into dealers' hands for new model introduction.

Nash, which resumed production following strike settlement last Monday, reports enough Hydra-Matics are available to sustain production through the 1953 model run which should be ending shortly. It is hoped that Hydra-Matics will be available by new model introduction late in November.

Pontiac swung to Powerglide production in earnest early last week with the BOP plants slated to join the show late last week. The proportion of cars Powerglide-equipped will be somewhat

less than the Hydra-Matic output with total production off about 20 per cent from normal output as BOP plants reach production this week.

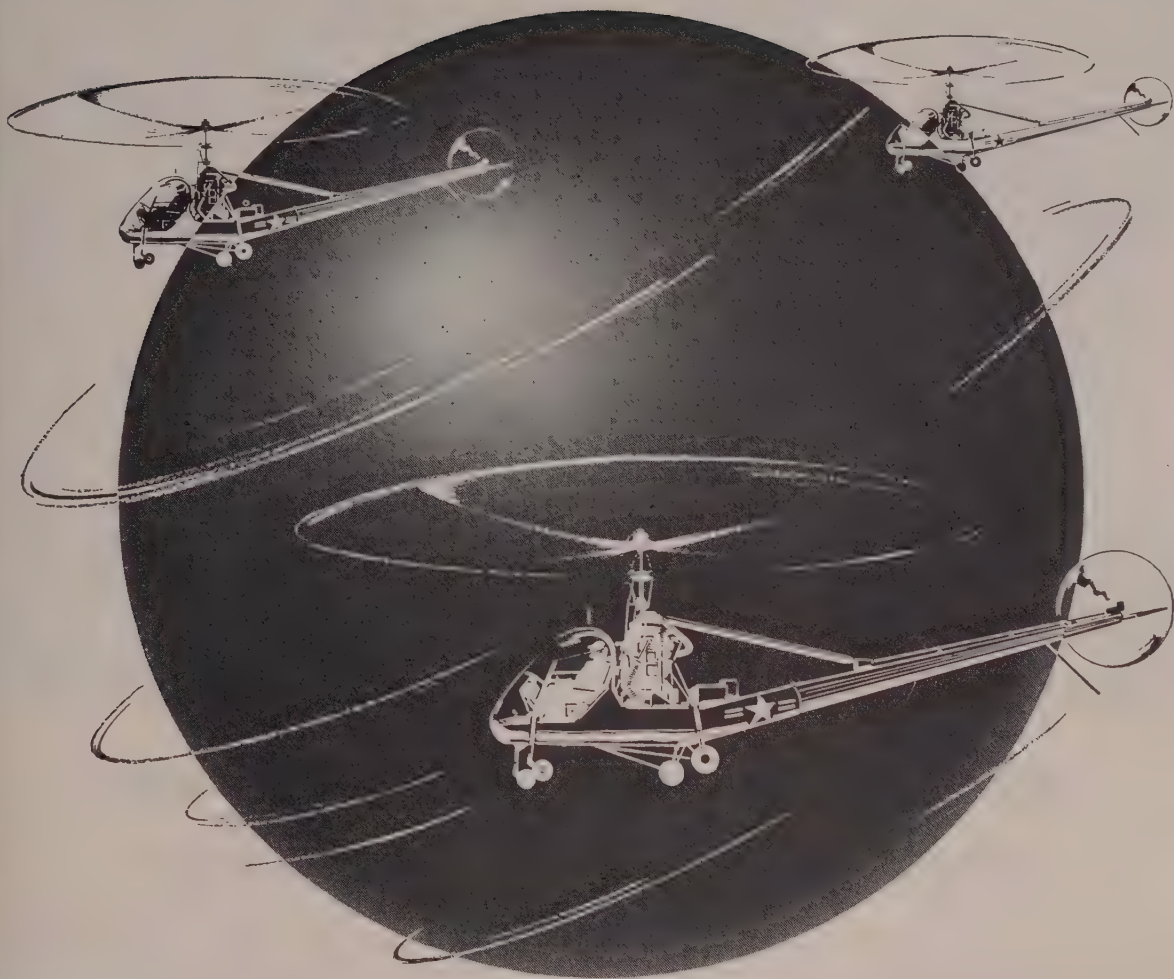
Still imponderable as this column was being written last week was Lincoln. Rumors continued to fly that the Merc-O-Matic would be adapted for Lincoln usage but one engineer reported off-the-record that the adaption was questionable mechanically and economically. The final crates of Hydra-Matics were emptied last week and with possible resumption of output in about a month, it seems a good bet that Lincoln will wait out return of the unit. Meanwhile, output of the Mercury is being increased following higher sales of the Mercury during August than in any month for the last three years.

From the Wastebasket

An interesting styling probe is incorporated in the Packard "Balboa" shown recently at the Michigan State Fair. The rear window has a reverse slope and is covered by a canopy which gives the car somewhat the appearance of a guppy swimming backwards. But, despite the startling appearance of the deal, the rear window is protected from sun, rain, etc., and can be rolled down like other windows on the car. In addition, the overhang permits greater headroom in the rear seat, a feature designers have been trying to accomplish for some time.

Sales of hard-tops are running 78,500 per month this year compared with only 46,900 last year. With approximately 2 million hard-tops purchased since the style was introduced, General Motors has made 56 per cent of the total, Ford Motor Co. has made 25 per cent, Chrysler built 8 per cent and the independents 11 per cent.

Next year Pontiac, Mercury and Nash will introduce air conditioning in addition to Buick, Oldsmobile, Cadillac, Dodge, DeSoto, Chrysler, Lincoln and Packard already so equipped. Although no more than 35,000 cars may be equipped with air conditioning in 1953, GM alone is gearing for a 100,000 volume in 1954.



Revolution in Accuracy

Rescue work . . . submarine hunt . . . aerial photography . . . the Hiller helicopter is a versatile performer. It can hover in one place, move up and down, forward and backward. That's why the Hiller demands bearings that carry all loads, that *stay* rigidly accurate, even under sudden shifts in blade speeds. New Departure meets that demand with bearings for Hiller applica-

tions shown below. Besides such heavy duty applications, New Departure makes a wide range of minute bearings for sensitive aircraft instruments. *Every* New Departure bearing—from midget to giant—is backed by the industry's most complete research and engineering facilities—all of which stand ready to serve the manufacturers' design and engineering staffs.

NOTHING ROLLS LIKE A BALL 



Main transmission of the Hiller helicopter uses New Departure bearings in the clutch assembly.

NEW DEPARTURE

BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
Also Makers of the Famous New Departure Coaster Brake



Tail rotor gear box, another of the Hiller's vital moving parts, is equipped with New Departure ball bearings.



Why pay for the steel you waste when you make hollow parts?

WHEN you make hollow parts from bar stock, you pay for chips and shavings you bore out and throw away! With Timken® seamless tubing, you eliminate this waste. The hole's already there. Finish boring is often the first production step. You cut machining time—get more parts per ton of steel.

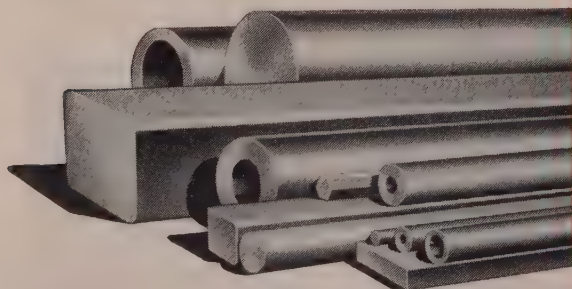
You make your machine tools more productive by using Timken seamless tubing. Screw machine stations normally used for drilling can be released for other jobs. You get added machine capacity without additional machines.

To save you even *more* steel, the Timken Company's

engineers will study your problem and recommend the most economical tube size for your hollow parts job—guaranteed to clean up to your dimensions.

Timken seamless tubing has fine forged quality. That's because the piercing process by which it is made is basically a forging operation. It gives the tubing a uniform grain flow for greater strength and a refined grain structure which brings out the best in the quality of the metal. The Timken Company's rigid quality control makes sure the quality is always uniform from tube to tube and heat to heat. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

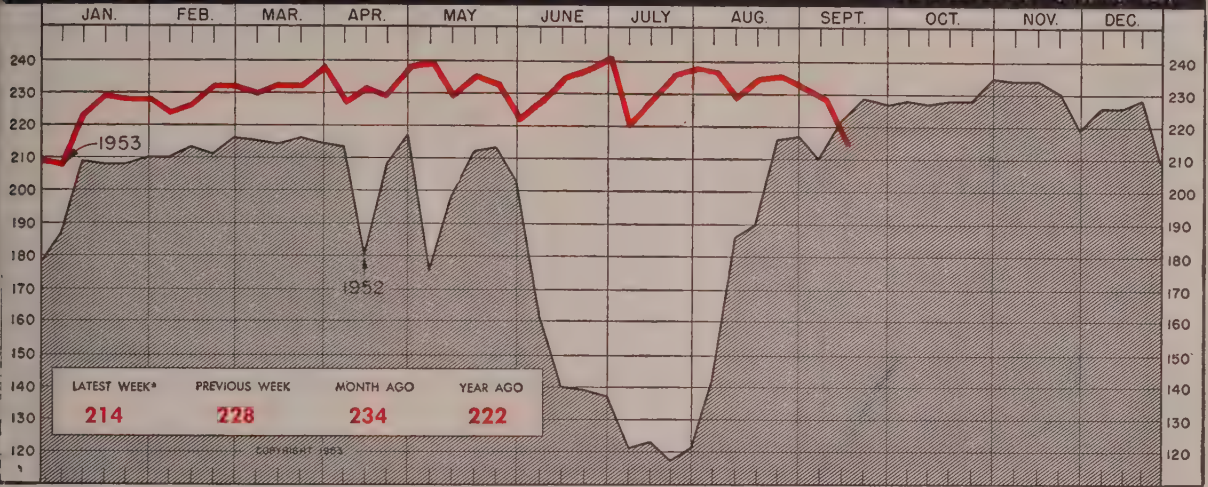
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

The Business Trend

STEEL's INDUSTRIAL PRODUCTION INDEX (1936-1939=100)



Production level will moderate slightly during the remainder of 1953. Withdrawal of heavy military demands leaves a reservoir of capacity

AN EASIER industrial production pace is indicated for the autumn months. Industry will turn out a high volume of goods, but operations will likely be lower than those prevailing over the first eight months. The frantic scramble for materials no longer will dominate the production scene.

Coming weeks will bring a moderate upturn in STEEL's industrial production index from the Labor Day week's low of 214, when holiday interruptions caused output to drop 14 points to the lowest point since the first week in January. For the first time this year, the index dipped below the comparable 1952 rate.

Factors causing the decline were a reduction in automobile outturn and a lower steel operating rate.

Automobile Output Slides . . .

The 116,121 cars and trucks built by U. S. manufacturers in the week ended Sept. 12, was the lowest volume in 14 weeks, says *Ward's Automotive Reports*. As a result of the holiday, outturn dipped almost 9 per cent below the previous week and, for the first time, fell below the comparable week in 1952. But

output so far this year now exceeds the 5,555,780 units completed in the entire year of 1952.

Retail deliveries of new cars are holding firm to a 6 million unit annual pace and new car stocks are only slightly above one month's supply. As of Aug. 31 dealers' inventories of new automobiles had risen for the thirteenth consecutive month and stocks are estimated at just under 500,000 units. Cadillac has a unique position in being the only producer whose orders still exceed deliveries.

Steel Production Adjusts . . .

Like automotive outturn, steel production slipped during the latest week. The operating rate, estimated by STEEL, for the week ended Sept. 12, was 88.5 per cent of capacity. At this rate, production was lower than any time during the past 13 months. Anticipation that operations will not soon return to former levels is responsible for recent declines in scrap prices.

The recent production adjustments in the steel industry were preceded by the greatest 12 months of output in history. From September, 1952, through August

of this year, furnaces poured 114,600,000 net tons of steel, the American Iron & Steel Institute says. During the week just ended, steel output was estimated at 2,036,000 net tons, a slight rise from the preceding week.

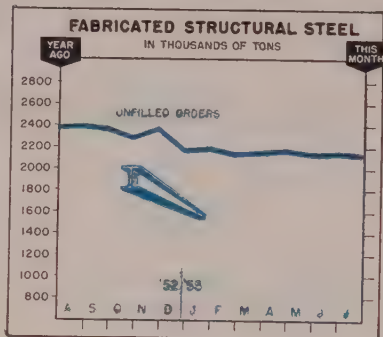
Appliance Producers Ready . . .

Correction of the supply-demand relationship appears to have been made by the appliance industry during the past three months. Although many manufacturers have raised prices on their products recently, higher sales have brought inventories of finished appliances into a better relationship with sales.

Present optimism of gas appliance manufacturers is traceable to the rapid expansion of natural gas pipelines and the incorporation of automatic features in their manufactures. Multiple purchases—orders for gas ranges and water heaters at the same time—by owners of new and remodeled homes have increased sales, also.

Electric Output Sets Record . . .

The same factors can be applied to sales of electric appliances. Moreover, heavy sales during the early part of the year have had a noticeable effect on the demand for electric power. Generation of 8,-



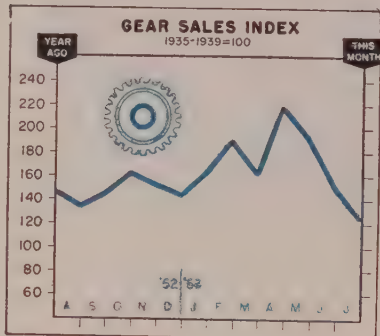
Fabricated Structural Steel

Thousands of Net Tons

Shipments		Backlogs	
1953	1952	1953	1952
Jan. ...	241.4	2,180	2,416
Feb. ...	251.1	2,128	2,408
Mar. ...	266.3	2,155	2,501
Apr. ...	263.2	2,168	2,350
May ...	263.8	2,179	2,263
June ...	274.6	2,153	2,261
July ...	222.0	2,134	2,361
Aug.	226.3	....	2,363
Sept.	227.6	....	2,342
Oct.	261.7	....	2,266
Nov.	222.6	....	2,357
Dec.	225.2	....	2,153

Total ... 2,664.3

American Institute of Steel Construction



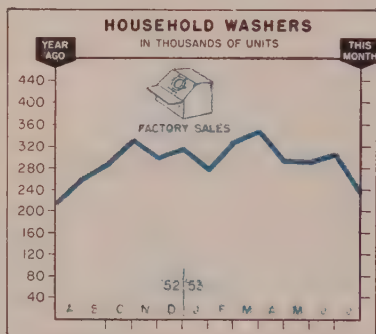
Gear Sales Index

(1947-1949=100)

	1953	1952	1951
Jan.	161.4	670.6*	764.6*
Feb.	158.1	539.5*	809.1*
Mar.	158.9	517.1*	830.7*
Apr.	217.1	478.7*	742.5*
May	189.8	425.9*	667.1*
June	146.5	452.3*	800.9*
July	120.7	145.3	589.1*
Aug. ....	....	132.3	564.2*
Sept. ....	....	143.4	630.0*
Oct. ....	....	160.8	703.4*
Nov. ....	....	150.9	530.0*
Dec. ....	....	140.9	716.5*

*(1935-1939=100)

American Gear Mfrs. Assn.



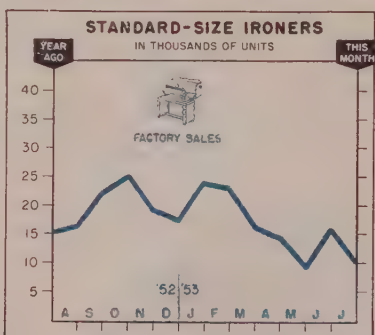
Household Washers

Sales Billed—Units

	1953	1952	1951
Jan.	277,309	213,998	321,092
Feb.	326,604	255,864	341,325
Mar.	345,989	248,431	363,455
Apr.	288,474	217,211	292,193
May	286,515	213,668	253,942
June	304,086	274,457	253,119
July	223,268	207,593	139,799
Aug. ....	....	254,537	239,061
Sept. ....	....	283,732	313,756
Oct. ....	....	327,814	297,210
Nov. ....	....	293,079	262,484
Dec. ....	....	310,661	218,664

Totals ... 3,101,045 3,301,123

American Home Laundry Mfrs. Assn.



Standard-Size Ironers

Factory Sales—Units

	1953	1952	1951
Jan.	24,395	15,636	24,600
Feb.	22,586	17,630	32,400
Mar.	16,066	13,913	34,700
Apr.	14,030	8,933	23,700
May	9,323	12,652	24,200
June	12,529	17,654	24,500
July	9,626	15,025	11,100
Aug. ....	....	16,477	17,200
Sept. ....	....	22,492	18,300
Oct. ....	....	25,204	29,800
Nov. ....	....	19,724	20,500
Dec. ....	....	16,798	16,900

Total ... 202,143 277,700

American Home Laundry Mfrs. Assn.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Aug. 10	Indus., Production.Sept. 14	Ranges, Gas .....Sept. 7
Durable Goods .....Aug. 10	Machine Tools ....Aug. 3	Refrigerators .....Aug. 3
Employ., Metalwk..Aug. 10	Malleable Castings.Sept. 7	Steel Castings .....July 20
Employ., Steel ....Aug. 31	Prices, Consumer..Aug. 31	Steel Forgings .....July 20
Foundry, Equip. ....Sept. 14	Prices, Wholesale..Aug. 24	Steel Shipments ...Sept. 7
Freight Cars .....Aug. 24	Pumps .....Aug. 24	Vacuum Cleaners ...Aug. 3
Furnaces, Indus. .Sept. 14	Radio, TV .....Aug. 31	Wages, Metalwk...Aug. 31
Gray Iron Castings.Sept. 7	Ranges, Elec. ....Aug. 3	Water Heaters ...Sept. 14

694,301,000 kilowatt-hours in the week ended Sept. 5, set another record, according to the Edison Electric Institute. All areas of the country participated in the increased use, and, as it has been through most of the summer, the southeastern states led all other sections in percentage of increase over 1952.

Railroad Earnings Up ...

Joining the electric utility industry in receiving a larger net income are the railroads. Net earnings, for the first seven months of 1953, after interest and rentals, have been estimated at \$490 million, compared with \$348 million in the corresponding period of 1952, the Association of American Railroads reports. Alongside the expanding earnings lies the gain in freight loadings that has taken place so far this year. Through the week ended Sept. 5, a total of 26,713,892 cars of revenue freight had been loaded. This compares with 25,400,944 carloads in the same period last year, which includes the time of the steel strike.

Truck Transportation Climbs ...

Another industry that is doing better this year than last is the motor carrier. Inter-city truck tonnage transported by these vehicles in the second quarter of 1953 was 13.5 per cent greater than that carried in the same period of 1952. The extent to which inter-city trucking has increased in recent years is spotlighted even better by the index of the American Trucking Associations, which rose to a new record, 261 per cent of the 1941 average in the second quarter of this year.

Securities Market Activity ...

Turning to banking, the most interesting recent development is the great increase in loans to brokers and dealers for purchasing or carrying securities. According to the Federal Reserve System's balance sheet of weekly reporting member banks in leading cities, these loans went up \$183 million in the week ended Sept. 2. This increase is almost half of the total gain of \$378 million, which has occurred since Sept. 3, 1952. From these

BAROMETERS OF BUSINESS

INDUSTRY

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
Steel Ingot Output (per cent of capacity) ² ..	88.5	95.5	101.0
Electric Power Distributed (million kwhr)...	7,963	8,694	7,654
Bitum. Coal Output (daily av.—1000 tons)...	1,595	1,628	1,533
Petroleum Production (daily av.—1000 bbl)...	6,500 ¹	6,534	6,461
Construction Volume (ENR—millions).....	\$321.0	\$273.5	\$264.6
Automobile, Truck Output (Ward's—units)...	122,497	132,574	137,295

TRADE

Freight Car Loadings (unit—1000 cars)....	700 ¹	799	881
Business Failures (Dun & Bradstreet, no.)...	131	178	91
Currency in Circulation (millions) ³	\$30,479	\$30,240	\$29,364
Dept. Store Sales (changes from year ago) ³	0%	-9%	-1%

FINANCE

Bank Clearings (Dun & Bradstreet, millions)	\$12,928	\$16,487	\$14,962
Federal Gross Debt (billions)	\$273.3	\$273.3	\$262.8
Bond Volume, NYSE (millions)	\$1.1	\$1.3	\$1.4
Stocks Sales, NYSE (thousands of shares)	4,538	6,554	6,099
Loans and Investments (billions) ⁴	\$79.4	\$79.3	\$75.2
U. S. Gov't. Obligations Held (billions) ⁴ ...	\$31.8	\$32.0	\$31.9

PRICES

STEEL's Finished Steel Price Index ⁵	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index ⁶	206.9	206.9	223.2
All Commodities ⁷	110.3	110.3	111.8
Commodities Other Than Farm & Foods ⁷ ...	114.7	114.7	113.2

*Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100.

figures, it might be inferred that a change in the market is anticipated for the near future by some dealers and customers.

Bank Deposit Growth Stunted ...

Concerning banking generally, the Federal Deposit Insurance Corporation says that total deposits of all insured banks increased 3 per cent during the year ended June 30. This rate of growth compares with a 7 per cent gain in the preceding fiscal year and was the smallest rise during any of the last four years. The 3 per cent increase in deposits was paralleled by a 3 per cent climb in assets over the year.

Government Holdings Drop ...

Assets of the 13,435 commercial banks totaled \$180 billion on June 30. Another \$20 billion in assets were held by insured mutual savings banks. Both types of banks held fewer U. S. government obligations than they did a year earlier. For commercial banks the decline amounted to over \$2 billion. Largely accounting for the decrease in federal obligations was the increase in loans. Total loans at commercial banks were 10 per cent more

than in June, 1952 and residential real estate loans from mutual savings banks towered 17 per cent above a year earlier.

Inventory Rise Slowed ...

In line with the tight conditions existing on the money markets, business tried to hold inventories down during July. Although, stocks rose over the previous month by about \$600 million, on an adjusted basis they totaled \$77.3 billion, almost unchanged from June.

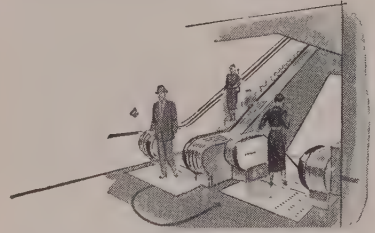
Primary Prices Dip ...

It may be a good thing for many businesses that inventories were stable, for a slight decline in prices at the wholesale level is revealed by the Bureau of Labor Statistics for August. The index of primary prices was 110.6 per cent of the 1947-1949 average in August, 0.3 per cent less than the previous month.

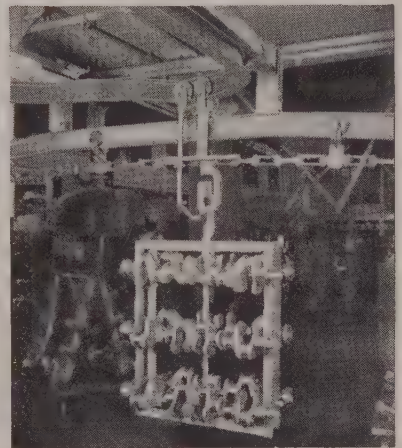
Trends Fore and Aft ...

After reaching an all-time high in August, construction costs dipped 0.3 per cent to 610.2 per cent of the 1913 average, *Engineering News-Record* says.

Trans-Free Automation



Trans-Free Conveyor System — automatically transfers loads from main Live Line to Free Lines—and back again.



One of the intermediate production stations in the Allied Trans-Free Conveyor System, showing a rack of parts being transferred from the Live Line to the Free Line.

At various locations production parts can be automatically removed from the main Live Line to adjacent Free Lines. At these points, intermediate production operations are performed. Upon completion, the loads are automatically transferred back to the main Live Line.

The Allied Trans-Free System is applicable to any type of product, large or small.

Allied are specialists on *Automation* and highly engineered *Load Transferring* material handling systems. Consult with our engineering staff on material handling problems that arise in your plant.

See Allied Catalog 952 in Sweet's Mechanical Industries or write us for a copy.




ALLIED

STEEL AND CONVEYORS, INC.

17353 HEALY AVE., DETROIT 12, MICH
Complete Material Handling Systems
Designed • Fabricated • Erected



A large industrial roller mill, likely for metal processing, is shown in a factory setting. The mill consists of two large horizontal rollers mounted on a heavy metal frame. The background shows other industrial structures and equipment, suggesting a large-scale manufacturing facility.

CARBON STEEL ROLLS • OHIOLOY ROLLS • OHIO "K" ROLLS
HOLL-O-CAST ROLLS • CHILLED IRON ROLLS • DENSOC
IRON ROLLS • NICKLE GRAIN ROLLS • SPECIAL IRON ROLLS
NIOLOY ROLLS • FLINTUFF ROLLS • OHIO DOUBLE • POUR ROLLS

Ohio Rolls

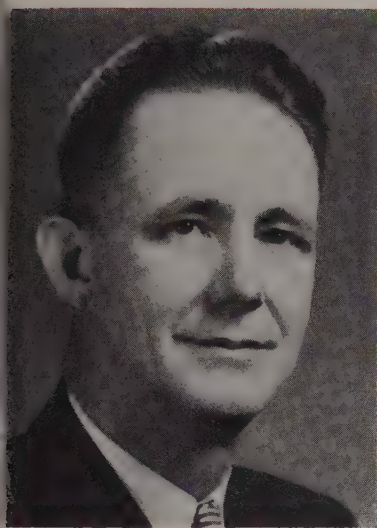
SHAPING METAL FOR ALL INDUSTRY

THE OHIO STEEL FOUNDRY CO.



LIMA, OHIO • Plants at Lima and Springfield, Oh

Men of Industry



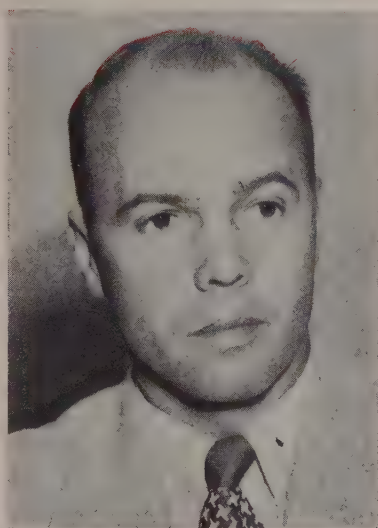
W. MONROE WELLS
... Reynolds assistant v. p.

W. Monroe Wells was named assistant vice president in charge of operations, **Reynolds Metals Co.**, Louisville. For the last three years he has served as general production control manager for the company with headquarters at its executive offices in Richmond, Va.

Everett W. Lundy was made assistant sales manager, **Peerless Pump Division**, Food Machinery & Chemical Corp., Los Angeles. Previously Pacific district manager for the pump firm, he is succeeded by **Robert H. Hull**, formerly Peerless' central district manager at Indianapolis. Mr. Hull is replaced by **Waldo T. Harman**, formerly Chicago branch manager.

William J. Thomas, general sales manager, was appointed general manager, tubular products division, **Babcock & Wilcox Co.**, Beaver Falls, Pa., and **Paul J. Utneher**, works manager, was named to the board of directors of the division.

P. C. Haldeman, general superintendent of the **Blaw-Knox Co.** rolls division at Pittsburgh, was promoted to works manager, Foote Construction Equipment Division at Nunda, N. Y. He is succeeded by **H. C. Stirling**, formerly production superintendent in charge of castings at the **Lewis Machinery Division**.



RALPH ZIMMERMAN
... NMB chief product engineer

Ralph Zimmerman, a product design engineer with **National Motor Bearing Co.**, Redwood, Calif., since 1942, was promoted to chief product engineer.

Harry V. Miles Jr., manager of filtration research and developments with **U. S. Hoffman Machinery Corp.**, has resigned to accept a position as assistant director of research and development with **Oliver United Filters Inc.**, Oakland, Calif.

Townsend Co., New Brighton, Pa., appointed **Fred J. Schreiber Jr.** as director of commercial research. He was formerly manager of commercial research with **National Tube Division**, U. S. Steel Corp., at Pittsburgh.

Ralph C. Nelson was appointed purchasing agent of **Benjamin Electric Mfg. Co.**, Des Plaines, Ill., succeeding the late **L. W. Kester**.

Marcus L. Furrey resigned as purchasing agent, **Rockwell Register Corp.**, Bellefontaine, O. He is replaced by **E. B. Sulkoske**.

Arthur J. LeBlanc was made executive assistant to **G. E. Ellsworth**, president of **Toronto Iron Works Ltd.** and **Central Bridge Co. Ltd.**, Toronto. He has been engaged in **Quebec-Labrador iron ore development** for the last two years.



PAUL B. BROWN
... joins Peninsular Grinding Wheel

Paul B. Brown was appointed vice president and general manager, **Peninsular Grinding Wheel Co.**, Detroit. He has been actively associated with the grinding wheel industry for the last 28 years, having been with **Norton Co.** for 23 years in both sales and manufacturing and until recently was vice president, bonded products and abrasive grain division, at **Carborundum Co.**

Bryant Machinery & Engineering Co., Chicago, announces appointment of the following corporate officers: **Martin J. Wiora** president to succeed the late **Alexander G. Bryant**, **Charles B. Tansley** executive vice president, **Robert A. Cole** vice president, **Daniel F. Laffey** secretary, and **Martin J. Wiora Jr.** treasurer.

Clair S. Reed was elected vice president, director and a member of the executive committee of **United Metal Craft Co.**, Ypsilanti, Mich., subsidiary, **Gar Wood Industries Inc.** He joined **Gar Wood** a year ago as assistant to the executive vice president and continues in that capacity in addition to assuming his new duties.

Kenneth O. Swanson, auditor of **Sharon Steel Corp.**, Sharon, Pa., was appointed secretary. He has served as general auditor since be-

coming connected with the company in 1944. In 1949 he was appointed assistant secretary.

William E. Johnson was appointed district representative in the Cleveland area for **Gisholt Machine Co.**, Madison, Wis.

Weirton Steel Co., division of **National Steel Corp.**, Weirton, W. Va., appointed **A. G. Parks** assistant vice president for industrial relations and **Edward A. Ross** manager of industrial relations with duties covering all divisions of that department.

H. Arthur Howe, manager of **General Electric Co.**'s laminated plastics plant at **Coshocton, O.**, since 1951, was promoted to manufacturing manager of the company's laminated and insulating products department. He continues headquarters and management at the **Coshocton plant**.

Theodore Jarvis was promoted to assistant chief engineer at **Ford Instrument Co.**, division of **Sperry Corp.** at **Long Island City, N. Y.** Mr. Jarvis, who is now responsible for engineering work connected with atomic energy projects, recently completed a year's study at the **Oak Ridge School of Reactor Technology**.

J. S. Fawcett was named director of **Fisher Scientific Co.**'s development laboratories, **Pittsburgh**.

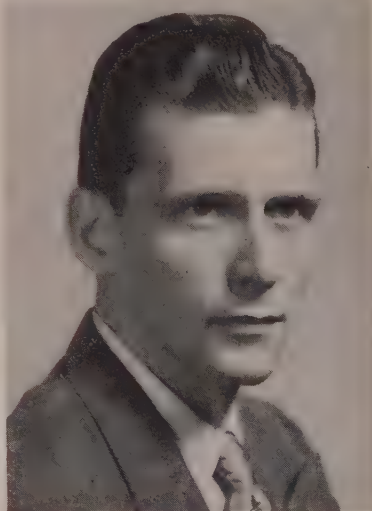
Kenneth T. Fawcett was elected president of **Dominion Brake Shoe Co.**, subsidiary, **American Brake Shoe Co.**, **New York**. **Thomas E. Akers**, former president, was elected chairman succeeding **Maurice N. Trainer**, who continues as president of the parent company. **Maynard B. Terry** was elected vice president.

Basic Refractories Inc., **Cleveland**, appointed **James W. Cameron** works engineer for its **Maple Grove, O.**, quarrying and burning plant operations.

William D. Grimmer was promoted from assistant to manager of **American Can Co.**'s Pacific division closing machine department succeeding **F. Joujon-Roche** who transfers from **San Francisco** to become manager of **Canco's** closing machine department in **New York**, a newly created position.



F. J. DeCRANE



L. J. MILLER

... purchasing posts at **Lamson & Sessions**

F. J. DeCrane assumes the duties of director of purchases of **Lamson & Sessions Co.**, **Cleveland**, and **L. J. Miller** becomes purchasing agent. Mr. DeCrane succeeds **G. W. Hinds**, who after 36 years retired from the company Aug. 15. Mr. Miller succeeds Mr. DeCrane.

Harry B. Lilley was promoted to manager of **Timken Roller Bearing Co.**'s steel and tube division district office in **Detroit**. He was office manager for the division at **Houston** and is replaced there by **John J. McGrann**. Mr. Lilley succeeds **L. W. Eppler** who has resigned to start his own automotive parts manufacturing company. In the **Milwaukee** office of the division, **R. R. Hershey**, sales engineer, was

transferred to the **Detroit** office and is replaced by **M. A. Conley**, former sales engineer at **Cleveland**.

Harrington-Wilson-Brown Co., **Mt. Vernon, N. Y.**, appointed **Fred A. Milnes** as its press specialist. He will supervise and assist in the sales and service of the mechanical and hydraulic presses manufactured by **Clearing Machine Corp.** Mr. Milnes was formerly export manager and sales engineer of **E. W. Bliss Co.**

Carl F. Jensen was made plant manager of the **Des Plaines, Ill.**, plant of the **Shakeproof Division**, **Illinois Tool Works**. Along with these duties, Mr. Jensen continues to be responsible for **Shakeproof's** special products engineering and sample parts operations located in **Elgin, Ill.**

John Tope was made assistant manager of the **Washington** office of **Republic Steel Corp.** He has been in sales work with **Republic** since 1936, for the last seven years in the **Detroit** sales office.

Donald H. Campbell was made comptroller of **Rigidized Metals Corp.**, **Buffalo**.

James H. Knapp Co., **Los Angeles**, appointed **J. B. Froblom** as a sales engineer to specialize in atmosphere control furnaces.

Glenn M. Brown, former president and general manager of **Ryerson & Haynes Inc.**, was elected president and general manager of **Automatic Steel Products Inc.**, **Canton, O.** He continues as a director of the former company.

Earl Hayward was appointed superintendent of the **Los Angeles** plant of **Fisher Body Division**, **General Motors Corp.**

Luther Evans was appointed to the newly created position of director of industrial relations for all **Dow Chemical Co.**'s operations, with headquarters at **Midland, Mich.** He formerly headed industrial relations at the **Texas** division.

Airway Products Inc., **Pontiac, Mich.**, appointed **H. R. Greenley** vice president and general sales manager.

Joseph M. Halloran will represent **Ajax Engineering Corp.** in the **New**

"Dagwood 6 Calling Danger Forward"



U. S. ARMY PHOTOGRAPH

G.I. Joe now puts his calls through a new field switchboard twice the capacity and one-third the size of the one toted by his World War II counterpart.

The new "board" has a constitution that can winter in Reykjavik, summer in Mombasa, and roll with a punch . . . just in case travel gets rough. Its retractable cords know when to come in out of the rain and goo.

Among the many essential parts of this instrument there is one named simply "SIGNAL, switchboard." It is a luminous-painted signal, operated by an electro-magnet, which "drops" into view when a line is calling. There's one "drop" for each telephone cord circuit; each drop is enclosed in a square housing made from Superior Hard Drawn Carbon Steel AISI C1008—.6815" I.D.

Square, .020" wall, 2.656" long. Tolerances are close— $\pm .005$ " on the length and $+.007$ ", $-.000$ " on width.

Mr. Lloyd Bender, Vice President of The North Electric Manufacturing Company, makers of the switchboard, says of Superior, "Your performance has been excellent—in workmanship, quality of material and delivery."

Are you looking for a good small-tubing source—one that gives you the widest choice of tubing analyses available in America today, one that can supply you with one or one-million feet, one known for its uniformly high quality, and its interest in you and your tube problems? Try Superior. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing available in Carbon, Alloy, and Stainless Steels, Nickel Alloys, Beryllium Copper, and Titanium



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All analyses .010" to $\frac{3}{8}$ " O.D.
Certain analyses in tight walls up to $2\frac{1}{8}$ " O.D.

England territory, handling the Trenton, N. J., company's line of low frequency induction furnaces.

Calvin J. Timmins joined the sales force of J. Alex Gordon & Co., Detroit, representative of Automatic Transportation Co.

Eugene Malecki was named manager of the warehousing and shipping division of Inland Steel Products Co. at Milwaukee. He succeeds Randall A. Burr, transferred to the Baltimore branch plant as assistant manager.

John Gill was appointed assistant superintendent of the coke plant at the Midland, Pa., Works of Crucible Steel Co. of America. M. A. Hurtt was made operating practice engineer.

Charles H. Myers was made assistant to the manager of the mining department of Mine Safety Appliances Co., Pittsburgh. Formerly a mining sales engineer in the Fairmont, W. Va., area, he is replaced in that territory by M. E. Condit.

New supervising engineers appointed in the engineering department at Caterpillar Tractor Co., Peoria, Ill., are Donald E. De Canniere to supervise work with bulldozers and cable controls and John A. Junck to supervise work on hydraulic controls and tool bars. These two sections, plus the section which includes scrapers, wagons and ripper design supervised by Woody Kimsey, will be under the direction of Carl Kepner, recently appointed assistant chief engineer.

Henry A. Snow was appointed abrasive engineer for Abrasive Products Co., Westboro, Mass., to cover Maine, New Hampshire and Vermont.

Perfection Stove Co. appointed H. C. Erhard sales manager of its Jersey City, N. J., sales district to succeed W. B. Gathings, transferred to the home office in Cleveland as assistant to the sales manager, appliance division. H. E. Thomas becomes manager, contract sales department, to succeed Mr. Erhard.

Horace D'Angelo will resign Oct. 15 as executive vice president and general manager, Harry Ferguson Inc., Detroit.



HAROLD O. SMITH
... heads Mullins plant operations

Mullins Mfg. Corp. appointed Harold O. Smith general manager of operations for its plants in Salem and Warren, O. He was works manager of the former plant and remains as acting works manager. A. F. Boone was named assistant sales manager, contract division, and A. P. Schmauch as chief industrial engineer.

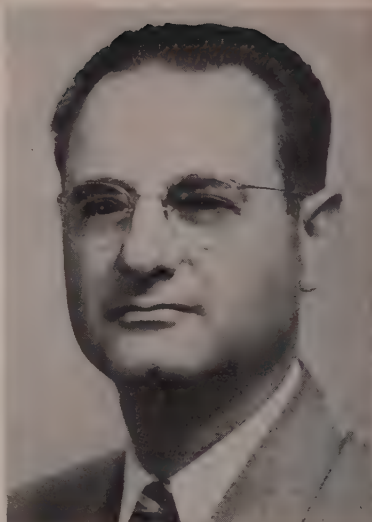
James J. Sherry Jr. joined Buick Motor Division, Flint, Mich., General Motors Corp., as an assistant director of purchases. He has been with GM since 1936 and previously served as assistant director of purchases in its purchasing and salvage section.

Atlas Chain & Mfg. Co., Philadelphia, division of Prudential Industries Inc., appointed Orville W. Schmidt as general sales manager. A member of the Atlas organization since 1948, he was most recently the midwest district sales manager with offices in Chicago.

Charles F. Pittman, assistant to the manager of General Electric Co.'s industry sales section, Schenectady, N. Y., retired after 42 years' service.

George C. Murphy was made general manager of Heilman Co., Allentown, Pa.

Field engineers appointed by Norton Co. include Burton G. Ebbeson to the Worcester, Mass., area and Charles M. Wellons to work out of the Philadelphia district office.



LEO A. WISE
... American Safety Razor purchasing post

American Safety Razor Corp., Brooklyn, N. Y., appointed Leo A. Wise director of purchasing. With the company for 33 years, he became purchasing agent in 1947.

Frank P. Cullen was elected president, Cullen-Friestedt Co., Chicago. He succeeds his father, the late F. J. Cullen. Edward V. Cullen, a vice president, also assumes the position of secretary. In other changes H. M. McFarlane, sales manager, was named vice president in charge of sales; Karl J. Biller, assistant secretary, was named a vice president and treasurer; and James Kudrna was made assistant secretary.

N. J. Cavalier was made Pacific Coast manager of Truscon Steel Division, Republic Steel Corp., with headquarters in Los Angeles. He succeeds G. R. Roden, made manager of sales, Engineering Window Products, at Youngstown.

James A. Holland was transferred from the Detroit branch office of Bay State Abrasive Products Co. to the southern California area with headquarters at Republic Supply Co. of California, company distributor.

K. L. Carver was elected a member of the board of directors of Plomb Tool Co., Los Angeles.

Vice Adm. John B. Moss (U. S. Navy, ret.), was appointed a consultant for Bell Aircraft Corp., Buffalo. He will work between

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That's because Wickwire Wire . . . Hard Drawn, Spheroidized or Oil Tempered . . . is a product of long experience, skilled craftsmanship and completely integrated facilities starting with actual steel making. Thus, every step of its production is under constant and uninterrupted control, subject to thorough-going testing, checking and inspection.

High or low carbon steel . . . round or shaped . . . in all tempers, grades and finishes, it pays to remember—*For the Wire You Require, Check First With Wickwire.*

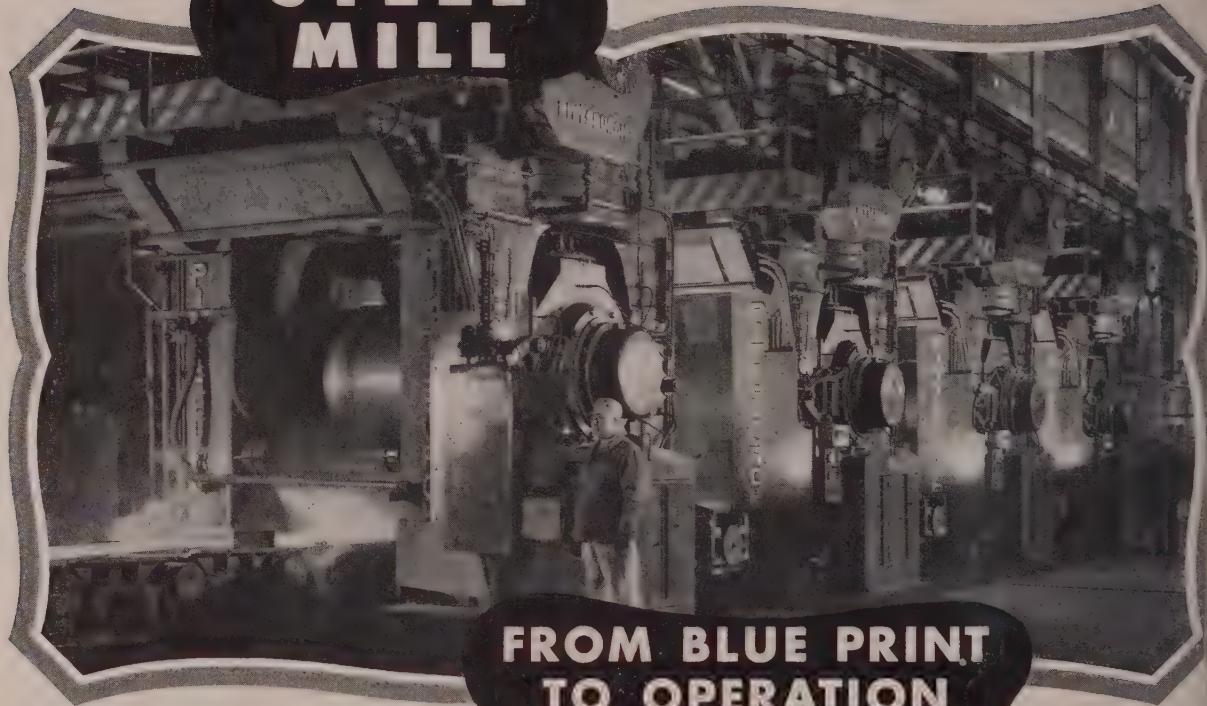
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**FROM BLUE PRINT
TO OPERATION
...WITH UNDIVIDED
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4-HIGH HOT STRIP MILL, DETROIT STEEL
CORPORATION, PORTSMOUTH, OHIO

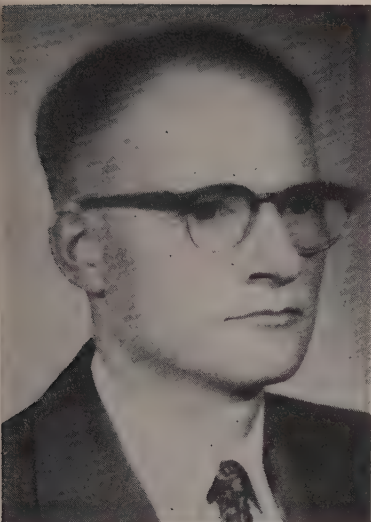
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ARTHUR E. HILLS
... new post at Cleveland Hardware



SEWARD H. FRENCH JR.
... Crucible Steel vice president

the company's Niagara Frontier Division and the Texas Division.

Arthur E. Hills was appointed sales manager, die casting division, **Cleveland Hardware & Forging Co.**, Cleveland.

Raymond P. Scheibel was made planning superintendent of the manufacturing division of **Jefferson Electric Co.**, Bellwood, Ill.

Fred C. Martin was made comptroller, **Dodge Division**, **Chrysler Corp.**, Detroit.

Brig. Gen. Merle H. Davis, who retired last month as chief of the Industrial Ammunition Branch, Army Ordnance, was appointed manufacturing and engineering consultant for **Clary Multiplier Corp.**, with headquarters at the San Gabriel, Calif., plant.

Seward H. French Jr. was appointed vice president of **Crucible Steel Co. of America**, Pittsburgh, in charge of industrial and public relations for the company. He joined Crucible in 1947 as assistant to the president in charge of those activities.

Thomas H. Sheehan was promoted to manager of manufacturing of **Houdaille-Hershey Corp.**, Detroit. **Charles B. Eisenhauer**, formerly manager of manufacturing, was assigned staff assistant to **Frank G. Fisher**, vice president and general manager.

E. M. Braden was made general sales manager, **Chrysler Division**, **Chrysler Corp.**, Detroit. For the last three months he was director of regions.

James B. Duke joined **Elastic Stop**

Nut Corp. of America, Union, N. J., as technical assistant to the general sales manager. He was formerly with **Hamilton Standard Division**, **United Aircraft Corp.**

Harbison-Walker Refractories Co., Pittsburgh, appointed **P. B. Weaver** assistant to the general sales manager.

Garold E. Hauer was elected vice president-engineering for **American Well Works**, Aurora, Ill.

J. J. Smith was named manager of plant facilities at Schenectady, N. Y., for **American Locomotive Co.** **Wallace H. Allison**, general superintendent of the locomotive division plant, was appointed manager. **W. L. Larson** becomes general plant manager of the **Dunkirk**, N. Y., and **Beaumont**, Tex., plants.

F. J. Wilson retired as assistant purchasing agent and steel buyer of **Electric Auto-Lite Co.**, Toledo, O.

Richard A. Ellis was made assistant district manager of the **Hamilton**, Ont., branch warehouse and sales district of **Atlas Steels Ltd.**

John E. McNeil was made western district sales manager, **Delco Products Division**, **General Motors Corp.** He has headquarters in Los Angeles.

John P. Clifford, vice president, **Richardson Scale Co.**, Clifton, N. J., retired after almost 50 years of company service. He will continue as a consultant.

Jack E. Lawson will head sales in the Detroit area of **Circo Equipment Co.**

OBITUARIES...

William M. Myers, 69, president, **Penn Steel Castings Co.**, Chester, Pa., died Sept. 7.

August O. Elting, 60, president, **Albany Steel & Brass Corp.**, Chicago, died Sept. 1.

Jacob S. Stern, 70, who retired in 1945 as head of **Modern Die Casting Corp.**, Chicago, died Sept. 1.

Henry Bartling, 60, application engineer of the metal industries group of **Allis-Chalmers Mfg. Co.'s** motor

and generator section, **Milwaukee**, died Aug. 21.

Curtis W. McGraw, 57, president and chairman of the board of **McGraw-Hill Publishing Co. Inc.**, New York, died Sept. 10.

T. W. Bell, 75, formerly sales manager in the Los Angeles area for **Jones & Laughlin Steel Corp.**, died Sept. 4.

Carleton Reynell, 68, former executive purchasing officer and traffic manager, **Worthington Corp.**, Harrison, N. J., died Sept. 7. He

retired last May after 20 years with the corporation.

J. J. Siefen, 78, founder and president of **J. J. Siefen Co.**, Detroit, died Aug. 23.

Leonard W. Harston, 64, until retirement in 1945 sales manager of **Republic Steel Corp.'s** steel and tube division, Cleveland, died Sept. 9 at his home in **Shaker Hts.**, O.

Roy F. Johnson, 60, manager, sales and service engineering, **Pullman-Standard Car Mfg. Co.**, Chicago, died Sept. 6.

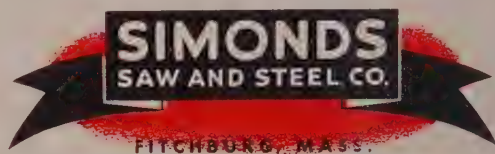
How many people would to fill this one man's



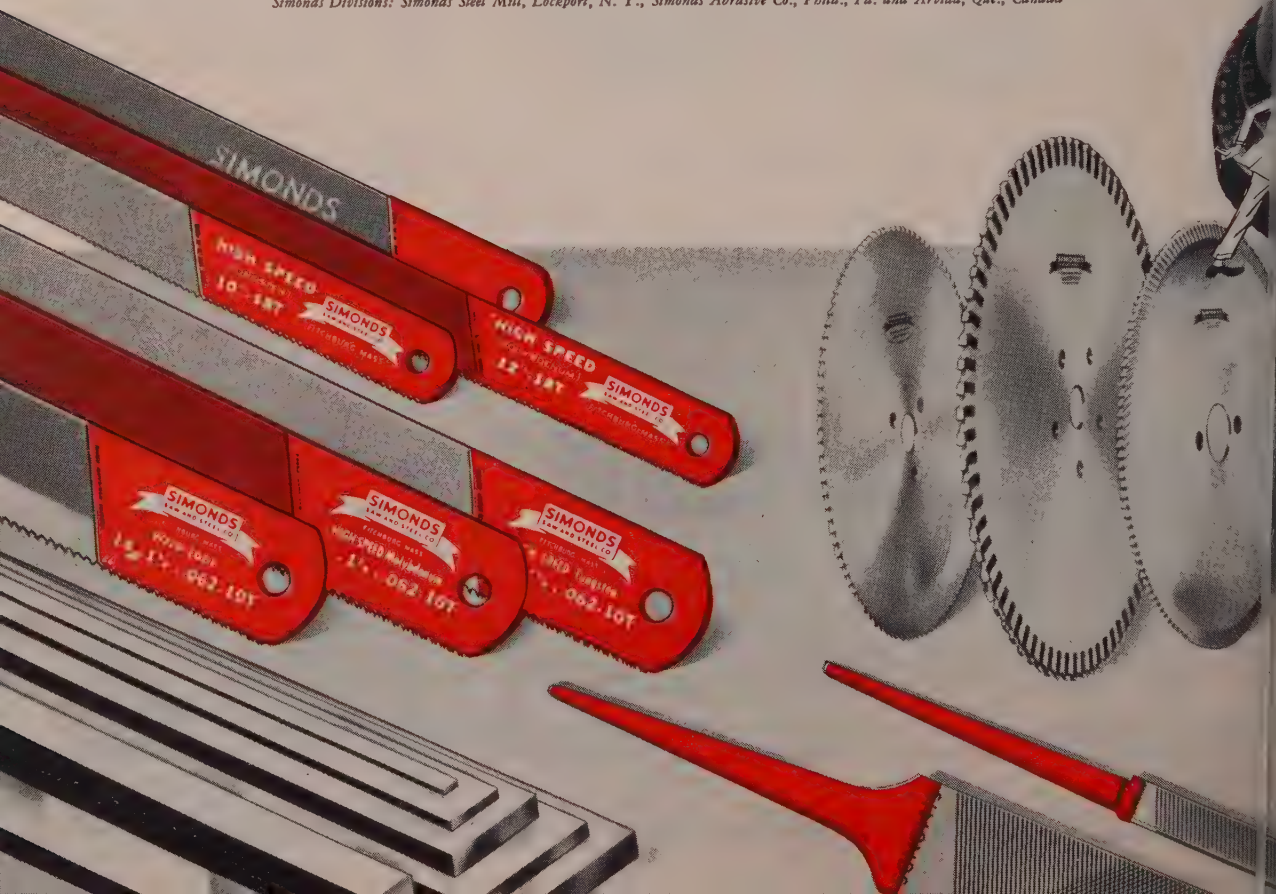
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does all these jobs for you: He carries your Simonds stock til you need it, *then delivers it right now* (a good thing to remember in your next "tight spot"). He saves you endless procurement headaches, as well as ordering, requisitioning, bookkeeping and other paper work. What's more, he and many of his salesmen are graduates of Simonds' famous "Little Red Schoolhouse." So they know how to apply Simonds cutting tools, how to make them pay off in best results, and how to anticipate your maintenance and replacement needs.

All these services save you work, *cut your costs*. That's why it's smart business to standardize on Simonds on all orders for Saws, Knives and Files. For then you get the top tools in either the metal or wood cutting fields... *100% quality-controlled from steel to finish-grinding*... backed up by top service from your Simonds Distributor. Call him today.



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shoes?



Canadian Foundry Opened

Entire output of Canada Iron Foundries' new facility will be sold to steelmakers

A FOUNDRY capable of turning out cast iron ingots ranging in weight from 3 to 16 tons was opened officially by Canada Iron Foundries Ltd., Montreal, Que., on Sept. 17.

Dignitaries from the steel industry and from civic circles toured the plant at Burlington street and Kenilworth avenue, Hamilton, Ont.

The highly mechanized foundry has a minimum daily production of 400 tons. The ingots are made both from cupola metal, which is melted on the premises, and from blast furnace metal which is transported in a molten form from Dominion Foundries & Steel Ltd.'s nearby plant.

The foundry's entire turnout will be sold to Canadian steel-producing companies.

AEC To Build Uranium Plant

A \$3 million uranium processing plant will be constructed at Shiprock, N. Mex., by the Atomic Energy Commission.

Eastern To Make Floor Plate

Eastern Stainless Steel Corp., Baltimore, has purchased machinery from Alan Wood Steel Co., Conshohocken, Pa., in order to roll stainless steel Diamondette floor plates at its mill. This type of floor plate will be rolled exclusively at Eastern Stainless Steel's plant.

Holden Purchases Equipment

A. F. Holden Co., New Haven, Conn., purchased the physical assets of Cook Heat Treating Corp., Los Angeles. These assets include 45 furnaces for all types of industrial and commercial heat treating applications plus sandblasting and vapor blasting facilities, testing equipment and four delivery trucks. This business will be managed by Cook Heat Treating Inc., a Nevada corporation, as a wholly-owned subsidiary of A. F. Holden Co. Officers of the subsidiary are: H. G. Howell, president; G. A. Zellmer, vice president and general manager; J. B. Carey, vice presi-

dent; A. F. Holden, treasurer; J. Phillip Nevins, secretary. The parent company manufactures salt baths, electrode furnaces and conveyors.

Metal Powder Firm To Move

Metal Powder Products Inc., Dayton, O., will move to a plant now under construction in Logan, O. The move will be completed within the next few months. Founded in 1946, the firm makes bearings, bushings, gears and cams out of metal powder.

Brainard Rivet Enlarges Plant

Brainard Rivet Co., Girard, O., is building a plant addition which will contain 6000 sq ft of manufacturing space.

Production Pool Organized

Albuquerque Production Pool Inc., Albuquerque, N. Mex., has been approved as a small-business defense production pool with the following members: Acoma Corp., Anderson Mfg. Co., Benischek Mfg. Co., W. L. Childers Welding & Machine Works, Consolidated Machine & Supply Co. Ltd., Crown Engineering, Gaddis Machine Works, Machine Engineering Corp., M. & F. Equipment Co., Mallow Plating & Mfg. Works, Quality Wood



Giant Sheave Takes Form

Forging, rolling and welding played a part in manufacture of four sheaves for the \$6-million vertical-lift bridge to Welfare Island, New York. Each sheave, as shown above, weighs 37 tons and is 15 ft in diameter. Hub was forged on a 2500-ton press and center-bored to an inside diameter of 22 in. at Bethlehem Steel Co.'s plant

Shop, and Troy's Welding Shop, all of Albuquerque; Sun Country Industries, Alameda, N. Mex.

Hydropress To Export Mill

A complete aluminum foil rolling mill installation of the Hydromil design is being supplied by Hydropress Inc., New York, to Takada Aluminum Co., Osaka, Japan.

Simmons Machine Names Agent

Simmons Machine & Tool Corp., Albany, N. Y., appointed Clare Perlin & Associates, Park Ridge, Ill., as its midwestern representatives. The Simmons line comprises large boring and facing mills, and lathes up to 72 in. swing, as well as machine tool reconditioning service.

Latrobe Steel Opens Branch

Latrobe Steel Co., Latrobe, Pa., opened its branch office and warehouse at 741 Ramsey Ave., Hillside, N. J. These facilities are under the supervision of W. J. Kennelly, district manager, and include the sales office formerly located at 40 W. 40th St., New York

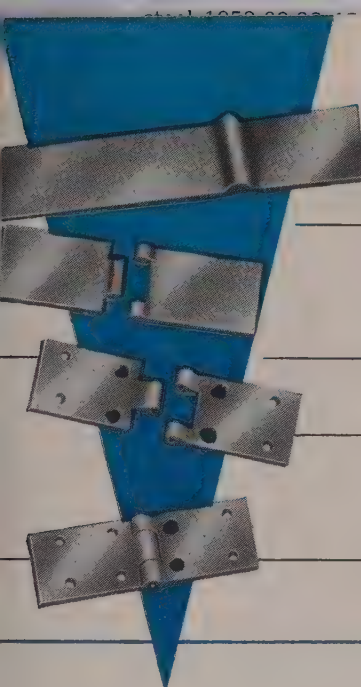
Bristol Completes Project

Bristol Co., Waterbury, Conn., completed an expansion program which increases its capacity to manufacture multiple-spline and hex socket screws. New facilities include a building and precision equipment for manufacturing and heat treating socket screws. The firm's capacity to turn out socket cap screws in particular has been greatly expanded.

Rockwell Mfg. Leases Plant

Rockwell Mfg. Co., Pittsburgh, leased a plant adjacent to its Homewood plant in Youngstown to provide more space for increasing production of tools. The building was owned by Lawson Mfg. Co., which is moving to New Kensington, Pa.

Rockwell's Crescent Machine Co. plant at Leetonia, O., recently was closed after a long labor dispute and efforts are being made to sell it. Plans at Homewood call for making some of the Crescent line there, as well as some other tools. Meanwhile, Enterprise Co., Colum-

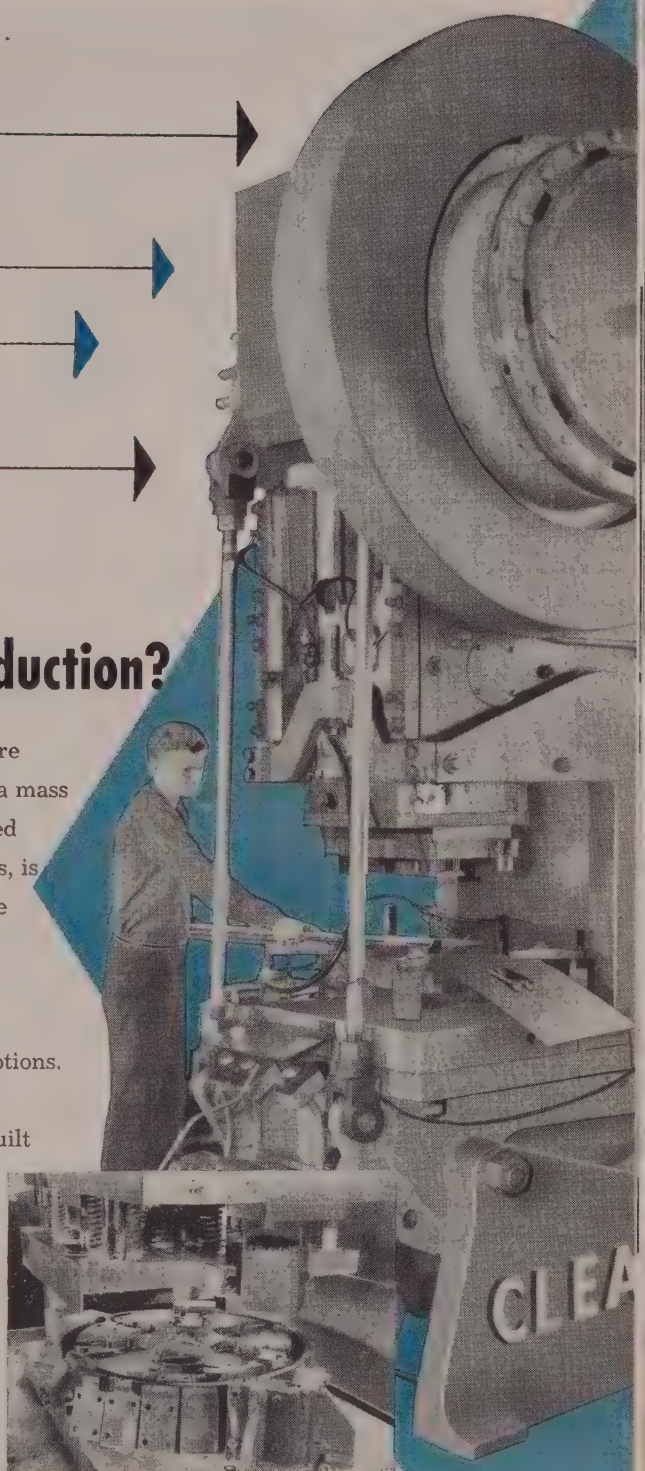


Profits Hinge on Steady Production?

Here's a heavy-duty job that Clearing O.B.I. presses are taking in stride. The Steel Parts Corp., Tipton, Indiana mass produces automotive door hinges from continuously fed strip. The strip, purchased with regularly spaced lobes, is $\frac{3}{8}$ " thick, $\frac{3}{4}$ " thick at the lobe. Both hinge sections are blanked in a single operation. Later operations on Clearing O.B.I. presses form the hinge joint and punch the mounting holes.

Production is continuous except for feeding interruptions. Rough work for an O.B.I.? Just the kind that Clearing presses with their husky all steel welded frames are built for. When profits hinge on steady production, call on Clearing Machine Corporation.

Another Clearing O.B.I. punches mounting holes. In this closeup of the die area, you can see the punched hinge sections.



CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

CLEARING MACHINE CORPORATION, 6497 West 65th St., Chicago 38, Illinois • HAMILTON DIVISION, Hamilton, Ohio



Delco Reconditioning Motors Damaged in Livonia, Mich., Fire

Delco Products Division, General Motors Corp., is devoting part of its facilities and manpower to repair electrical motors damaged in the fire at Livonia, Mich. At left above, fire-damaged motors roll-in, while at right, work-

ers are shown inspecting a few of them to determine where to start in on the task of reconditioning them for Detroit Transmission Division. STEEL, Aug. 31, p. 44, incorrectly stated that Delco-Remy Division was doing the repair job

biana, O., has bought rights to make planer and band saw lines under the Crescent trade name.

Attica Plant To Make Parts

Westinghouse Electric Corp.'s plant at Attica, N. Y., which has been building industrial stokers, will become a branch plant of the firm's Motor & Control Division whose main plant is in Buffalo. The Attica plant will produce parts for electric motors and some other products. Stoker work at the plant should be finished by Sept. 30 and production of the new items should be in full production within six to eight months after that date.

American Chain Moves Plant

American Chain & Cable Co. Inc., Bridgeport, Conn., will move its Los Angeles plant to 2216 S. Garfield Blvd., that city. The firm manufactures aircraft cable assemblies, wire rope stock, chain welding rods, cables and aircraft terminals.

Pierson Opens Warehouse

R. J. Pierson, former vice president of Barry Steel Corp., Detroit, opened a steel warehouse at Glendale, O. The warehouse will operate under the name of Gateway Steel & Supply Co. and will process and distribute flat rolled steel products in the Cincinnati area.

Plans Materials Handling Clinic

Second in a series of traveling clinics on materials handling scheduled for 1953 by Material Handling Institute, Pittsburgh, will convene Oct. 2 at Sheraton-Plaza Hotel, Boston, at the request of and in co-operation with the New England chapter, American Material Handling Society. Purpose of the clinic is to develop among users a better understanding of the correct application of materials handling equipment to industry's most pressing problems.

Institute Builds Laboratory

Construction has begun on a \$1.4 million laboratory building to house chemical research at Battelle Memorial Institute, Columbus, O. Dr. Clyde Williams is president.

Erie Resistor Expands Plants

Erie Resistor of Canada Ltd., a wholly-owned subsidiary of Erie Resistor Corp., Erie, Pa., will construct a plant at Trenton, Ont.

The plant will contain 21,000 sq ft of floor space and will be four times as large as Resistor's present Canadian location in Toronto, Ont. Resistor's Canadian subsidiary plans to sell its present Toronto location when the new plant is finished.

Recent expansion of the Erie Resistor Corp. includes a 60,000 sq ft plant in Holly Springs, Miss.,

and the purchase of new equipment for improvements in the plants at Erie. Erie Resistor's English subsidiary is constructing a building for increased manufacturing at its location in Great Yarmouth, England.

Another expansion under consideration by Resistor's top management is establishment of a plant for manufacturing electronics products in Australia. It is anticipated that this plant will be financed and managed by Erie Resistor Ltd. of England.

Electrotechnic Changes Hands

Electrotechnic Corp., Azusa, Calif., was purchased by Telautograph Corp., New York. Electrotechnic will operate as a wholly-owned subsidiary for the manufacture of communication control systems.

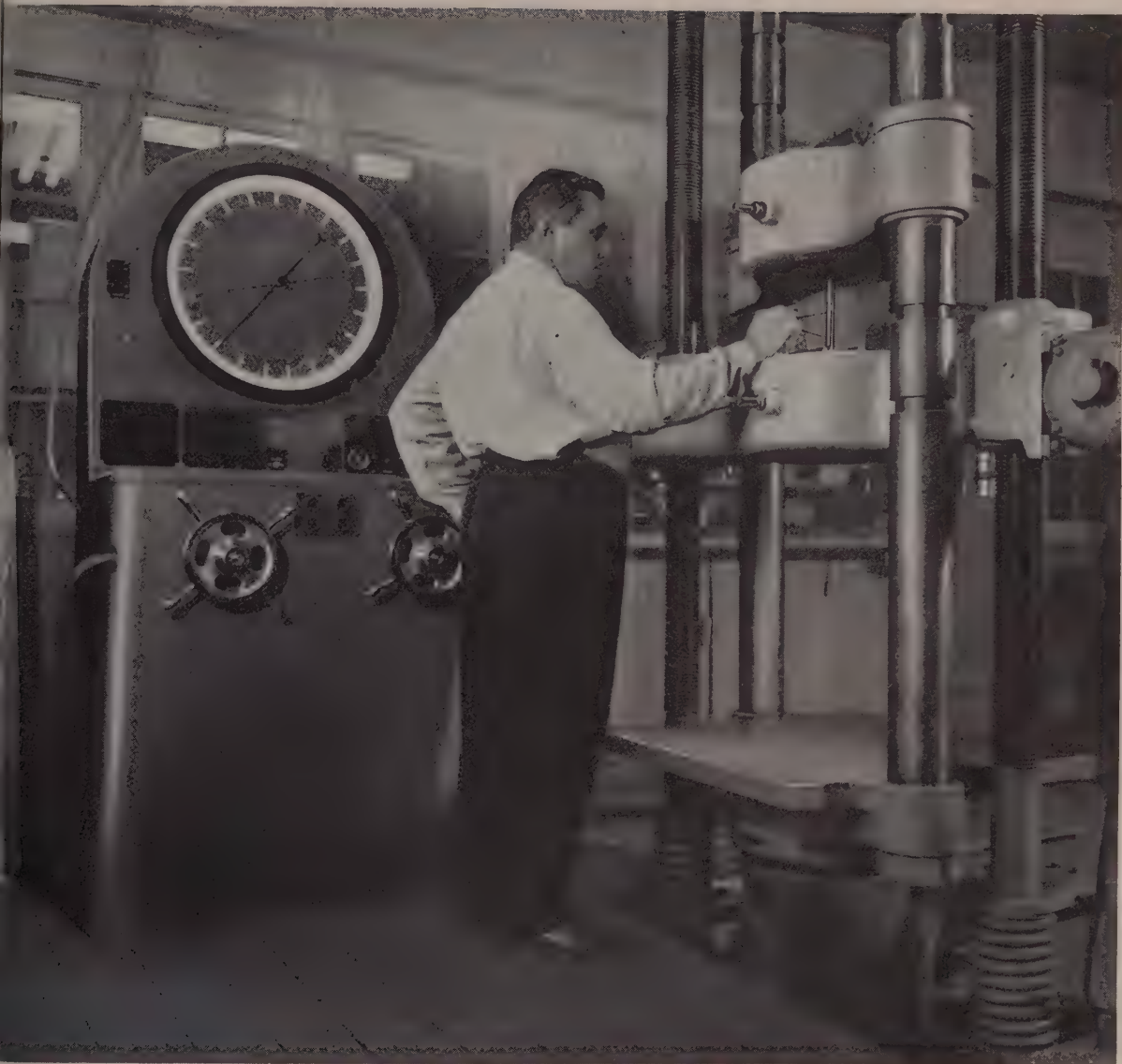
Trevor Enlarges Warehouse

Trevor Steel Co., Center Line, Mich., is doubling the size of its warehouse facilities as well as enlarging its offices. Russell F. Trevor is president.

Castings Firm Appoints Agent

Alloy Precision Castings Co., Cleveland, appointed Industrial Products Sales Inc., Akron, as its field sales engineer for Ohio and

(Please Turn to Page 121)



How Much Can a Tough Tube Take?

Plenty, if you're talking about cold drawn seamless *steel* hydraulic tubing by Summerill. For we know how vital hydraulic tube performance can be. Whatever the product you're making—machinery, jet engines, power transmission equipment, instruments or brakes—you've got to be sure that the tubing you use *never fails*.

That's why we actually pull apart sections of Summerill tubing many times a day . . . subject it to extreme hydraulic pressures and

sharp angle bends . . . and go over every piece of tubing we ship with a micrometer to check its uniform dimensions. It's all part of the close quality control we exert to make sure Summerill hydraulic tubing does a *better* job in your product.

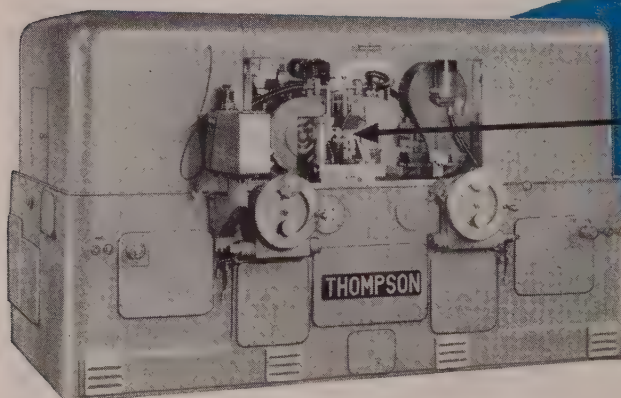
Let us show you how you can improve safety factors, maintain easy fabrication and eliminate on-the-job failures with *steel* tubing.
 ● Summerill Tubing Company Div., Columbia Steel & Shafting Company, Pittsburgh 30, Pa.

W&D 4559



IN COLD DRAWN SEAMLESS STEEL TUBING
 SPECIFY *Summerill* AND BE SURE!

New Thompson AUTOMATIC double wheel TRUFORM Grinder speeds jet engine production GRINDS BOTH SIDES OF JET TURBINE BUCKETS OR BLADES SIMULTANEOUSLY IN A SINGLE SETTING



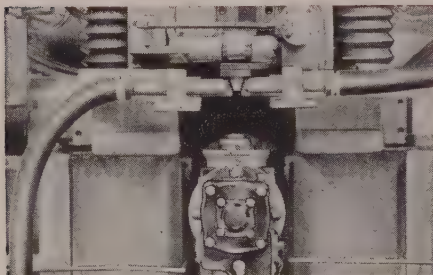
To grind root sections on gas turbine buckets with greatest accuracy and productivity, Thompson developed this new AUTOMATIC double wheel TRUFORMING machine featuring simultaneous grinding of both sides of root section with one setting of work.



**Grinds rough to finish in 110 seconds . . .
or 30 buckets per hour**

Hood doors, work clamps, coolant flow, grinding and crushing cycles are actuated in automatic sequence on the new Thompson AUTOMATIC double wheel TRUFORM Grinder.

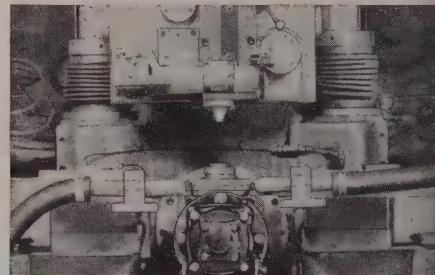
On a bucket having 2" length of form similar in design to the one in the diagram above with .150" stock removal per side from rough to finish size, production is 30 buckets per hour at a steady day after day rate. This includes down time for dressing, regrinding the crusher roll, initial machine warm up period, wheel changing and diamond changing. Actual machine time from rough forging or casting to finish is 104 seconds plus 6 seconds for loading and unloading time . . . makes total time floor to floor 110 seconds per piece.



**FOR ABSOLUTE SYMMETRY
BOTH WHEELS ARE
DRESSED FROM A
SINGLE CRUSHER ROLL**

◀ **GRINDING
POSITION**

**CRUSHING
POSITION** ▶



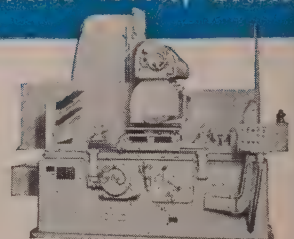
Standard THOMPSON TRUFORM Machines also grind jet buckets faster, better



By means of multiple grinding of jet turbine buckets the standard TRUFORM Grinders still offer high production plus many advantages such as flexibility of standard machine design and lower first cost. Although compared to the new AUTOMATIC the standard TRUFORM requires more skillful set up and tooling.

◀ **Typical tooling on Type "C"
TRUFORM producing 24 buckets
per hour. Type "B" TRUFORM
produces 18 parts per hour.**

**FOR COMPLETE DETAILS WRITE TODAY
The Thompson Grinder Co.
Springfield, Ohio**



Thompson Type "C" TRUFORM

**Thompson
SURFACE
Grinders**

(Continued from Page 118)
Michigan. Industrial Products
ales, with branch offices in Day-
n, O., and Detroit, handles cast-
gs, forgings, stampings, fasten-
s and welded steel tubing.

New Firm To Make Castings

A group of former officials and
shareholders of Falcon Bronze Co.
re organizing a new firm in
Youngstown to make brass, bronze
and copper castings for the steel
industry. The group is headed by
M. Nesselbush, former presi-
ent of Falcon Bronze which quit
business recently as a result of a
prolonged strike by United Steel-
workers of America, CIO. Falcon
old its properties and business to
American Brake Shoe Co., New
York. The new firm has worked
at an agreement with the union
and is exercising an option on Har-
s Fabricating Co.'s plant at Low-
ville, O.

Rice & Adams Halts Operations

Rice & Adams Equipment Divi-
sion, Pressed Steel Car Co. Inc.,
Buffalo, halted manufacturing op-
erations. The firm is a pioneer
manufacturer of dairy equipment
and was founded in the 1890's. It
was purchased by Pressed Steel
Car Co. Inc., Chicago, in 1950.

A company announcement said
that the Rice & Adams operation
has been profitable, but that
Pressed Steel Car is now centering
its major operations in Chicago
and on the West Coast. A spare
parts operation will be continued
definitely at the Buffalo plant,
but it was indicated Pressed Steel
Car will sell this limited phase of
its operations if a buyer can be
found.

Equipment Maker Builds

S & C Electric Canada Ltd., a
new company which is associated
with S & C Electric Co., Chicago, is
completing a plant in the Toronto,
Ont., area. The plant will have 20,-
000 sq ft of floor space and will
manufacture power fuses, load-
break switches, cutouts and metal-
lized switchgear. These products
have been produced in Toronto for
many years through a manu-
facturing arrangement with a
Canadian company.

Willys Buys Firm

**Chase Aircraft, a wholly-owned
subsidiary, will continue to
make airplane parts**

Chase Aircraft Co., West Tren-
ton, N. J., became a wholly-owned
subsidiary of Willys Motors Inc.,
Toledo, O., with purchase by the
latter firm for \$1,690,000 from
Michael Stroukoff of his 51 per
cent interest in Chase. Willys ac-
quired the initial 49 per cent stock
interest from Henry J. Kaiser Co.
at the time of the purchase of
Willys-Overland assets by Kaiser
Mfg. Corp. and the change of that
company's name to Willys Motors
Inc. on Apr. 28.

Chase will continue in business
at its present location, making air-
plane parts. Officers of Chase are:
Clay P. Bedford, president; William
A. Cannon, vice president and
treasurer; H. E. Ryker, vice presi-
dent and general manager of the
West Trenton Division.

Mr. Stroukoff has formed a new
company, Stroukoff Aircraft Corp.,
which has an option to purchase
some of the properties of Chase
and to take over leases and other
properties. A research and devel-
opment contract held by Chase may
be transferred to Stroukoff Air-
craft.

Continental Can Forms Division

Continental Can Co.'s two recent
acquisitions, Benjamin C. Betner
Co. and Shellmar Products Corp.,
have been consolidated into the
company's new Shellmar Betner
Flexible Packaging Division. Ben-
jamin C. Betner Jr. is in charge of
operations for the new division
with headquarters in Mt. Vernon,
O., former main office of Shellmar.
Division plants are located in Mt.
Vernon and Zanesville, O.; Apple-
ton, Wis.; Devon, Pa.; Richmond,
Va.; Columbus, Ga.; Beaumont and
Paris, Tex.; Los Angeles and South
Gate, Calif. In addition there are
five former Shellmar plants in
Latin America and affiliates in
other foreign countries.

Stevens Opens Warehouse

Frederic B. Stevens Inc., Detroit,
opened a customer service ware-
house in Springfield, O., to be op-

erated in conjunction with the
firm's plant in that city. The com-
pany makes metal finishing equip-
ment and supplies for the foundry
industry.

Standard Tool Expands

Standard Tool & Mfg. Co., De-
troit, designer and manufacturer of
special machine tools, added 2000
sq ft of floor space to its assembly
department. George C. Steyskal
was appointed factory manager;
D. A. Tyo Jr., plant superintendent.
Oscar M. Bates continues as office
manager and purchasing agent.

Scrap Companies Unite

Continental Iron & Steel Co.,
New York, is now affiliated with
Southwest Steel Corp., Pittsburgh.
Both firms are engaged in the
scrap business. With the same
personnel, the New York firm will
continue operations under the name
of Continental Iron & Steel Co.
Division of Southwest Steel Corp.

Will Make Stretch Form Block

Hufford Machine Works Inc., El
Segundo, Calif., will manufacture
and market a flexible stretch form
block developed by Northrop Air-
craft Inc. Used as a machine at-
tachment with stretch presses, the
form block provides a flexible and
economic method of producing
small preproduction-run quantities
of curved sections. It was de-
signed originally for use with an
A10 Hufford stretch press but is
adaptable for use with other ex-
isting types of stretch press equip-
ment.

X-ray Maker Names Dealer

North American Philips Co. Inc.,
Mt. Vernon, N. Y., appointed Thom-
as D. Shadduck X-ray Co., Bing-
hamton, N. Y., as its dealer in that
territory. Shadduck will sell and
service Philips medical and indus-
trial x-ray diagnostic and therapy
equipment.

Moves Chicago District Office

American Wheelabrator & Equip-
ment Corp., Mishawaka, Ind.,
moved its Chicago district office to
2406 W. Lunt Ave. Robert M. Rich
continues as district manager, as-
sisted by Lawrence W. Kohlmeyer
(Please Turn to Page 124)



SKF

Increases

this improvement
in series 222 and 223

increases the
service life
2 to 3½ times

*other advantages
are important*

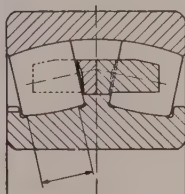
ECONOMY: When designing new equipment, the desired life can be obtained by using smaller or lighter bearings at considerable cost saving.

COMBINED LOADS: This great forward step in bearing design provides a Spherical Roller Bearing capable of carrying heavier combinations of radial and thrust loads or pure thrust loads of greater magnitude.

SELF-ALIGNMENT: The important self-aligning feature of **SKF** Spherical Roller Bearings has been preserved, so that considerable misalignment between the shaft and housing has no ill effect whatever on bearing capacity or life.

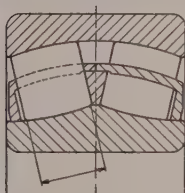
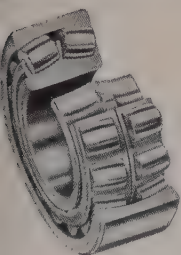
Capacity

spherical roller bearings **25% to 50%**
by means of improved internal design



BEARING 22315

This is the Spherical Roller Bearing design originated by **SKF** more than 30 years ago. The cross-section shows how the integral inner ring flanges, and the undercuts adjacent thereto, limit the effective length of the rollers.



BEARING 22315C

Here is the *latest SKF* improvement, a *revolutionary advance in design*. Effective roller guiding is accomplished by means of a separate ring. This eliminates the need for undercuts! This type of guide ring permits the rollers to take the position which their contact with the rings dictates. This assures uniform load distribution over the entire length of the longer rollers at all times. *Result*—greatly increased capacity and life.

SKF, the originator of the Spherical Roller Bearing, has, here again, provided Industry with another *first* through this improved design. During more than 4 years, thousands of installations have been made in railroad journals, vibrating screens, steel mill machinery and numerous other fields. Performance, in all cases, has been outstanding.

SKF Sales Engineers in our District Offices throughout the country will assist you in making use of the important advantages of the improved internal design of **SKF** Spherical Roller Bearings.

7423 A



This 12-page booklet gives you additional facts—sizes available—added capacity, size by size—increased life you can expect for each size—dimensional tabulations—and load and speed data. Write for your free copy of Bulletin 365-1 now.

SKF INDUSTRIES, INC., Dept. 616,
Philadelphia 32, Pa., manufacturers of
SKF and HESS-BRIGHT bearings.



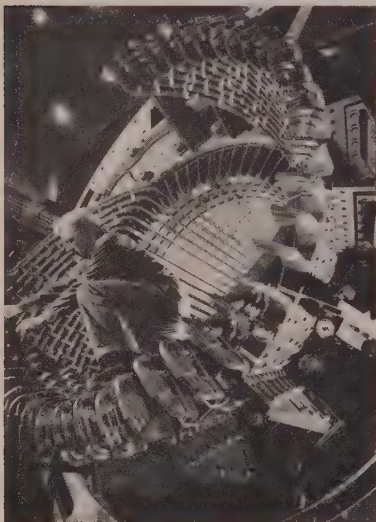
(Continued from Page 121)
and Floyd H. Toman as district sales engineers.

Mongerson Enlarges Facilities

Mongerson's Electrical Machine Works Inc., Bakersfield, Calif., is expanding. Expansion of the company, which was incorporated recently, is being directed by Ray Mongerson, founder; W. R. Burlingham, chairman of the board; D. Deleray Mouron, president. The latter two industrialists are owners of Screw Products Corp. of America, Delron Co. Inc., Electromec Inc., and other manufacturing companies in Southern California. The firm makes electrical switches for irrigation and oil field use.

Le Count Tool Works Moves

W. G. Le Count Tool Works, Norwalk, Conn., was incorporated as Le Count Tool Works Inc. and moved to larger quarters at 390 Capitol Ave., Hartford, Conn. Management of the plant has been taken over by John H. Dowd and Michael Lombardi, with W. H. Le Count being retained in a research and advisory capacity. The company makes expanding mandrels, etc.



Power Portrait

A workman is shown applying insulating tape to the coil ends of the stator for a 135,000-kw turbine generator. This machine is being made in the East Pittsburgh plant of Westinghouse Electric Corp. Plant's capacity to produce large generators has been doubled

Interstate Steel Opens Office

Interstate Steel Co., Evanston, Ill., established a branch sales office at 132 E. 30th St., Indianapolis. The office is headed by Lawrence W. Schellhammer, formerly with Inland Steel Co. and Jones & Laughlin Steel Corp.

Drug Store Miners

WHEN Fairway Realty Co. took over a Providence, R. I., building for remodeling, workmen "prospected" it inch-by-inch. For decades the place had been used by a jewelry manufacturer, Ostby & Barton. And year-by-year tiny filings of precious metals had gathered in floor and ceiling cracks.

The Fairway "miners" sucked up a poke of gold and silver dust, worth nearly \$40,000—enough to pay a good chunk of the remodeling costs.

Now the building is two-thirds filled with a dozen small firms, reports the New England Council, mostly jewelry-making concerns.

Syro Steel Builds Addition

Syro Steel Co., Girard, O., is building a 10,000 sq ft addition. Charles Syak, president, says it will give the company "more elbow room" in its new plant into which it moved recently.

Elgin Seeks Enterprises

Elgin National Watch Co., Elgin, Ill., plans to diversify into two new fields—miniature electronic components and precision production instruments. The company has undertaken an intensive search program to locate concerns in these specific fields "with a view to affiliation," says J. G. Shennan, president.

Elgin has prepared an "enterprises wanted" brochure which tells in detail the objectives of the program, the type of operations Elgin is interested in, and the advantages accruing to concerns affiliating with the 89-year-old firm.

To make basic investigations of

prospective affiliates and to separate likely and unlikely prospects from inquiries, the company has set up a "commercial development" department headed by Gordon Odell of the Elgin managerial staff.

Electronics and instrumentation are logical diversification choices because they parallel the Elgin tradition of precision workmanship. Manufacturers' sales in electronics rose from \$576 million in 1946 to \$4350 million in 1952, while automatic production instruments have enjoyed a 21 per cent annual growth rate since 1946. By contrast, the watch industry has experienced since 1940 a growth rate of 7.16 per cent.

Canada Wire Buys Plant

Canada Wire & Cable Co. Ltd., Toronto, Ont., purchased a new plant in Smith's Falls, Ont., and will transfer equipment to the new unit from its Leaside, Ont., plant, says James Y. Murdoch, president. The program will cost about \$750,000.

Basco Mfg. Appoints Agents

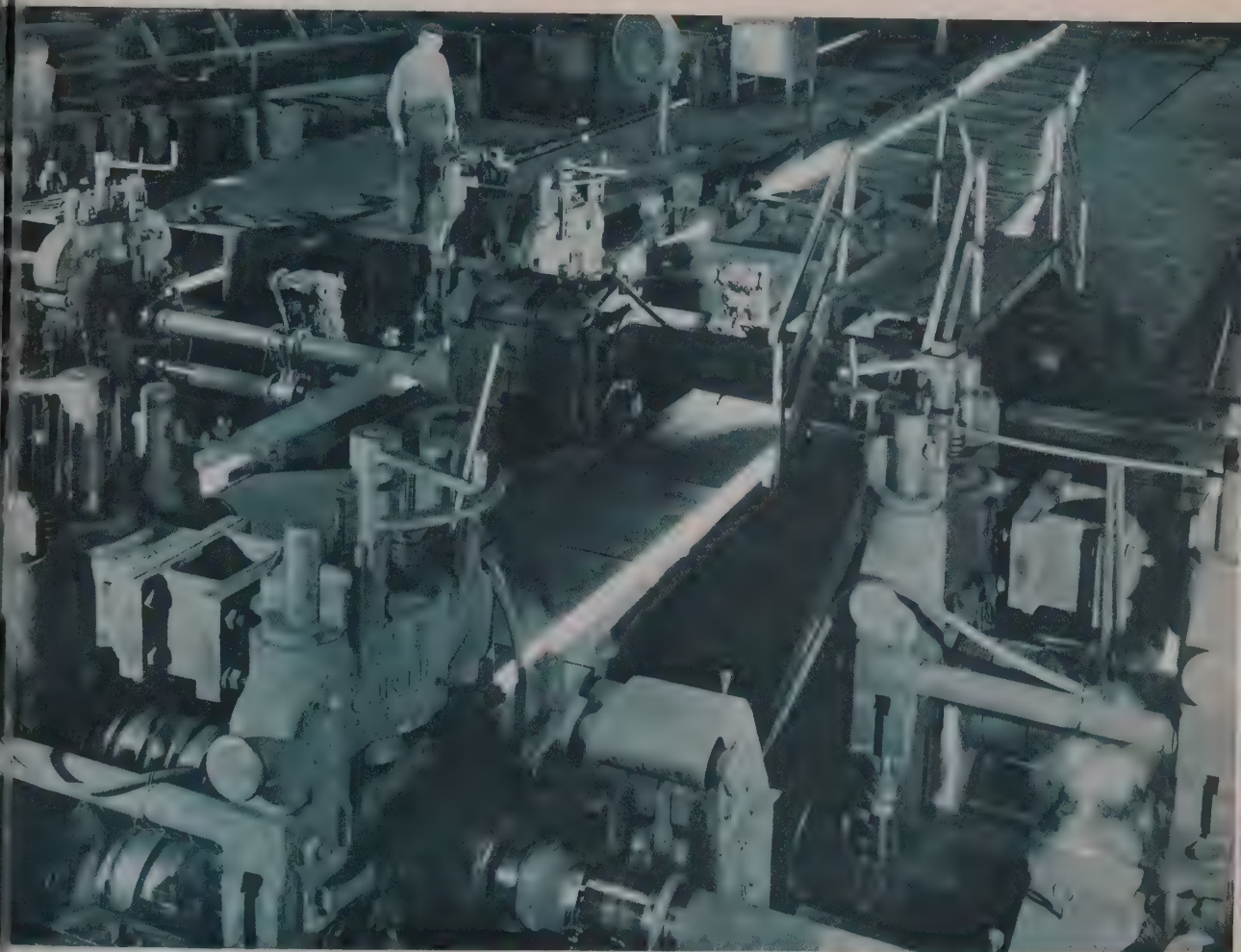
Basco Mfg. Co., Stamford, Conn., appointed as representatives for the sale of its separators: Charles Koslowsky, Kansas City, Mo. Francis Hughes & Associates Inc., Montreal, Que.; John R. Whitney & Co., Boston; Brown & Stuart Co., Stamford; Robert F. Evans & Sons, Torrance, Calif.; Lyman F. Warren Co., St. Paul; McLoehn Co., Rockford, Ill. Basco also appointed as distributors to handle marketing of its line of sheet steel separators: Schlank-Savage Co. Inc., Harrison, N. J.; Clark Hopkins Equipment Co., Philadelphia; J. G. Cardineau & Co., Englewood, N. J.; J. W. Jackson Co., Cleveland.

California Firms Merge

Sierra Engineering Co. merges with R. A. Hawks Co., both of Sierra Madre, Calif. The latter organization will be operated as R. A. Hawks Co. Division of Sierra Engineering Co. Precision job machine work will be carried on at the Hawks Division while research and development work in the mechanical and human engineering fields will be conducted by Sierra. Sierra product lines include miniature mechanical chain and sprockets and the prosthetic components

CONTINENTAL

CROSS COUNTRY MERCHANT MILL



Complete Rolling Mill Installations ★

LABBING MILLS
NIVERSAL MILLS
PLATE MILLS
OT STRIP MILLS
OLD STRIP MILLS
TEMPER MILLS

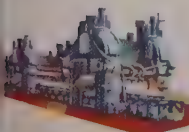
Mills complete with
Auxiliary Equipment
★ ★ ★
CONTINENTAL CHIPPER
ROLL LATHES
SPECIAL MACHINERY

BLOOMING MILLS
STRUCTURAL MILLS
RAIL MILLS
BILLET MILLS
ROD MILLS
MERCHANT MILLS

CASTINGS—carbon and alloy steel
from 20 to 250,000 pounds

ROLLS—iron, alloy iron and steel
rolls for all types of rolling mills

WELDMENTS—fabricated steel
plate, or cast-weld design.



Plants at
East Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.

CHICAGO • PITTSBURGH



Do you know these facts about vanadium?

Vanadium is available in quantities for every application.

Ferrovanadium is one of the most versatile, economical ferro alloys. It gives new life and endurance to virtually every type of alloy steel and iron. Its applications range from watch springs to giant forgings. *And a little goes a long way*, with small additions often doing the work of large additions of other alloys.

Through a long-range program of planned expansion, Vanadium Corporation has played a leading role in keeping vanadium available. Latest results of this program . . .

VCA mines in the U.S. and overseas offer a reliable, growing source of the finest vanadium ore.

New and enlarged facilities at the VCA plant at Cambridge, Ohio, assure a plentiful supply of highest-quality Vancoram Ferrovanadium for every iron and steel application.*

In the years ahead, Vanadium Corporation will continue to keep ahead of the growing demand for vanadium throughout American industry—producing increased quantities of Vancoram Ferrovanadium for both military and civilian use.

**For greater shipping economy and ease of handling, Vancoram Ferrovanadium can be furnished in palletized form.*



VANADIUM CORPORATION OF AMERICA

420 Lexington Avenue, New York 17, N. Y.

DETROIT • CHICAGO • PITTSBURGH • CLEVELAND

Technical Outlook

September 21, 1953

LIFETIME BATTERIES—First of two thousand new nickel-cadmium batteries from France will be installed shortly in U.S. naval aircraft. Once in place, they will require no attention, and in most cases will last the lifetime of the plane. Offsetting the high initial cost are some definite advantages: Ninety per cent more ampere-hour capacity, hermetically-sealed cells requiring no refilling with water, no hydrogen produced during recharging, and a non-corrosive electrolyte. Another plus: Batteries can be located anywhere without thought of accessibility for later servicing.

MORE LEADED STEEL—Lead-bearing alloy steel appears to be making headway in the machining fields. By adding 0.15 to 0.35 per cent lead to standard AISI 4140, for instance, machining is reported to be 50 per cent faster, cutting is cooler and tool life doubled in some cases. Mechanical properties of the lead-bearing alloy are said to be the same as the standard alloy. At least one warehouser, Ryerson, is carrying a full stock of two qualities, AISI 4140 and 8620.

HOT BEARING STEEL—A bearing steel developed for use at elevated temperatures is announced by Bower Roller Bearing Co., Detroit. To minimize the problems of annealing and machining a high carbon steel, they came up with a nickel-chromium-molybdenum carburizing grade that is subsequently case hardened. Steel has performed very well in temperatures up to 500°F, and temperature up to 900°F for 100 hours have developed no permanent change in hardness or dimensions.

OILLESS COOLANT—Recent demonstration of Dypral, a new machine coolant developed by Dynamic Industrial Products, Danbury, Conn., got the nod of approval from spectators. It is a true chemical solution, completely water

soluble and free of any oil. Touted as an all-purpose coolant, it is odorless, smokeless, does not foam, and does not turn rancid in use or storage. Examples of its efficiency: 4130 cut at 450 sf with up to 100 per cent increase in tool life in one case; 4140 cut at 165 sf; 52-102 cut at 330 sf. A 10-1 water mixture costs 19 cents per gallon.

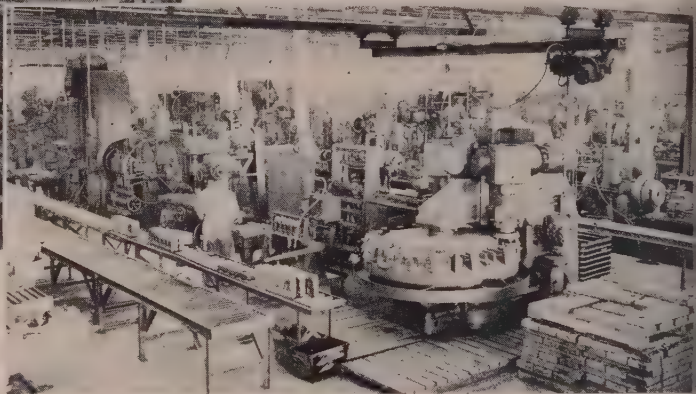
NEW LINE UPS—Aircraft industry is paying increasing attention to precision optical instruments, such as transit and level, theodolite and telescope, as aids in building tools. Instead of using mechanical means, settings for large assembly and mating jigs, for instance, are taken directly from line of sight.

STAINLESS BLANKETS—Stainless steel in thicknesses of 0.002 and 0.004 inches is used for insulation blankets in some jet planes. Between sheets of this near-foil stainless is packed a layer of asbestos or fiberglass. Used as shield between hot sections of the plane and pilot's compartment, it effectively keeps engine heat out of the cockpit.

WHAT'S ON THE INSIDE—You can't get along without electric motors, so don't miss the cover story on NEMA's new standards for frame sizes, 1 to 30 hp. How builders can crowd more horses into the same space and how it's going to affect you is on p. 128 . . . Then there's the one about the plater who found he was doing better with a nickel substitute. His explanation is on p. 174 . . . Even if you didn't start the Carbon Bar selection story last week, this installment and the concluding one next week are well worth your time. It's on p. 131 this week . . . There're two ways of protecting a water system from corrosion, and one of the nation's authorities on water treatment develops the subject from there, p. 181.



Machinery builders will be first to benefit from redesign. Motor cavities can be smaller or more horsepower can be squeezed into same space. Big motor users can expect some temporary inconvenience in parts and replacement-motor stocking; they'll gain in long run.



UP-RATED MOTORS



Bigger Inside, Smaller Outside

New designs will slim down the nonproductive parts of electric motors consistent with 25 years of refinements in the working parts. Old standards step aside for progress

By THOMAS F. HRUBY
Associate Editor

MORE HORSEPOWER per pound will pay dividends in lower handling and storage costs, more economical mounting platforms and easier installation and maintenance.

In a nutshell, that's how the recently-approved 1 to 30-hp ac motor rerating program of National Electrical Manufacturers Association will affect industry. There's bound to be transition inconveniences for builders and users alike; but, as one motor manufacturer's spokesman put it, "... no matter how you look at it, progress is the motivating factor and we can't buck it any longer."

How It Started—More specifically, this is the "why" of the program: Most integral horsepower electric induction motors are today still built to basic frame size-horsepower relationships established nearly 25 years ago, this despite technological advances designed into the working portions

of the motor during that period. That existing standards were holding up progress was evident to motor builders for some time. Changing standards on a basic component like motors, however, is not done without carefully weighing all factors.

Electric motors supply power to 85 per cent of this country's production machinery, and much of our industrial success is traceable to the fact that motor standards have meant safe, compact, reliable power no matter whose nameplate was on the motor. Motor manufacturers, gathered last fall at the NEMA meeting in Atlantic City, agreed that tentative new standards should be drawn up, and these were approved in May.

User Advantages — Under the new standards, a 5-hp motor, for instance, will continue to do everything the older 5-hp motor did. Torques, temperature rise and speeds defined under a specific rat-

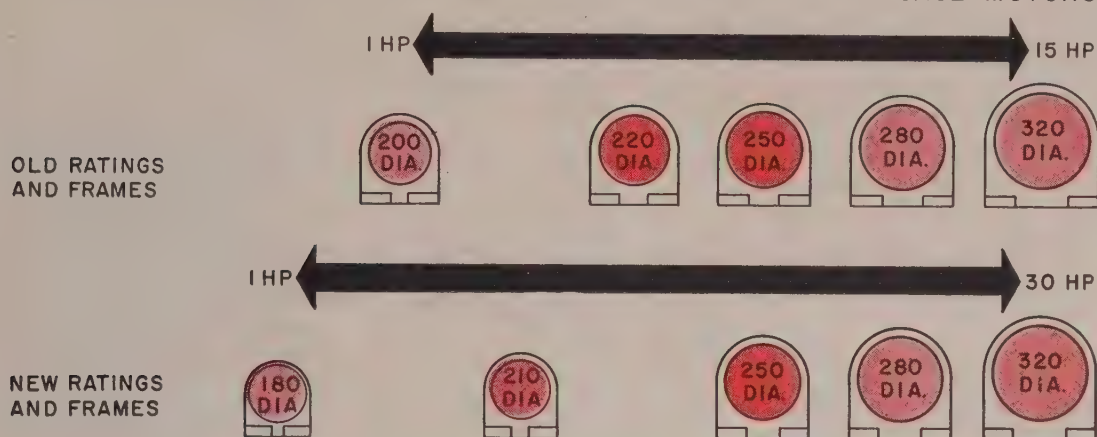
ing are not changed. Drip-proof motors will still be 40° C rise; fan-cooled will still be 55° C rise. Difference will show up in the frame dimensions which will all be smaller.

Probably the original equipment builders — machine tool, pumps, heating and ventilating, etc.—are most interested in smaller, more compact motors for the obvious reasons of appearance, size and weight of their finished products. These benefits are actually passed directly to the user who gets a machine requiring less floor space, reduced installation time and expense.

Fewer Frames—In the frames 180 diameter and larger, motor manufacturers learned over the years that a fewer number of frame diameters and at least two horsepower ratings per frame for any given speed, provide a better utilization of materials and minimum of parts. This new program

COMPARISON OF FRAME AND HORSEPOWER RANGES

POLYPHASE SQUIRREL-CAGE MOTORS



utilizes only five diameters in the range of 1 to 30-hp open and 1 to 5-hp enclosed ratings, against six formerly used.

Since 3 and 5-hp ratings fit easily into the 210 diameter, there was no longer any need for retaining the 200 and 220 diameters. Thus the 210 replaces the 200 and 220 diameters. However, since some of the new rerated motors have the same frame designations as the previous standard, the letter "U" has been added to indicate larger shaft extension dimensions. To the user these changes mean fewer mounting problems and a minimum of spare parts stocking.

Some Apprehension—A transition to rerated motors is understandably going to inconvenience the user who operates large numbers of motors. It will mean stocking additional renewal parts and perhaps spare motors. But eventually, because he does operate more electrical horsepower, motor builders believe the big user will realize more of the benefits from standards which trim non-productive weight from his motor power.

Equally important, space trimming will enable the user to solve the ever recurring problem of increasing horsepower on machines because of new load requirements. For instance, a 254U could be mounted in the same space as an old 254-frame size with a corresponding jump in horsepower from to 7½.

Age of Refinements—Stepped-up industrial pace of the last 20 years is reflected in motor design. The new and improved materials of the boom era are responsible for smaller, harder-working motor parts which in turn are responsible for the changed standards.

Basically, the design engineer has only four components with which to work in improving his motor design . . . conductor, insulation, magnetic steel and mechanical parts. Copper is still the same basic conductor that was used in early motors; it is the changes in the other three components that have enabled design-

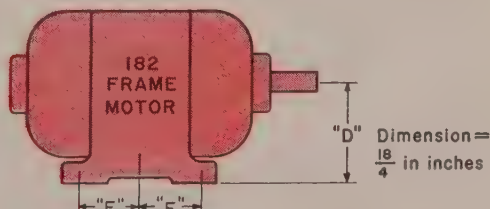
ers to get more out of a motor of the same size.

Insulation Changes—Concept of insulation has probably changed more than anything else. In 1929, standards were based upon use of cotton-covered wire, and paper and cotton slot and phase insulation. Impregnating varnishes were made of natural resins, oils and solvents. In short, good dielectric strength presupposed massive insulation.

Today insulations are "man-made" synthetic materials that have gradually replaced cotton and paper just as synthetic yarns have replaced the natural fibers in the textile industry. Synthetic

FIRST 2 DIGITS OF FRAME NUMBER = 4 x "D" DIMENSION

Example: A shaft height of 4½ inches, multiplied by 4, gives 18—designating a 180 diameter motor.



THIRD DIGIT OF FRAME NUMBER IS OBTAINED FROM "F" DIMENSION

Example: if the "F" dimension is 2½ inches, the preferred chart gives the third digit as "2". In this case, a 182 frame motor is designated.

POLYPHASE MOTORS, DESIGNS A AND B

Horizontal and Vertical, 60 cycles, 550 volts and less, General-purpose,

Squirrel-cage

Open-type, 40° C

HP	3600 RPM OLD NEW	1800 RPM OLD NEW	1200 RPM OLD NEW	900 RPM OLD NEW	720 RPM OLD NEW	600 RPM OLD NEW
1/2	...	...	...	204 182	...	...
3/4	...	...	203 182	224 184	...	...
1	...	203 182	204 184	225 213	254 213	254 215
1 1/2	203 182	204 184	224 184	254 213	254 215	284 254U
2	204 184	224 184	225 213	254 215	284 254U	324 256U
3	224 184	225 213	254 215	284 254U	324 256U	326 286U
5	225 213	254 215	284 254U	324 256U	326 286U	364 324U
7 1/2	254 215	284 254	324 256U	326 284U	364 324U	365 326U
10	284 254U	324 256	326 284U	364 286U	365 326U	...
15	324 256U	326 284	364 324U	265 326U	...	...
20	326 284U	364 286	365 326U	...	...	...
25	364S 286U	364 324	...	...	...	...
30	364S 324S	365 326	...	...	...	...
40	365S 326S	...	...	...	...	...

Totally-enclosed, Fan-cooled Type, 55° C

HP	3600 RPM OLD NEW	1800 RPM OLD NEW	1200 RPM OLD NEW	900 RPM OLD NEW	720 RPM OLD NEW	600 RPM OLD NEW
1/2	...	...	...	204† 182	...	...
3/4	...	...	203† 182	224† 184	...	...
1	...	203† 182	204† 184	225† 213	254 213	254 215
1 1/2	203† 182	204† 184	224† 184	254† 213	254 215	284 254U
2	204† 184	224† 184	225† 213	254† 215	284 254U	324 256U
3	224 184	225† 213	254† 215	284† 254U	324 256U	326 286U
5	225 213	254 215	284 254U	324 256U	326 286U	365 324U
7 1/2	254 215	284 254U	324 256U	326 284U	365 324U	* 326U
10	284 254U	324 256U	326 284U	364 286U	* 326U	...
15	324 256U	326 284U	364 324U	365 326U	...	...
20	326 286U	364 286U	365 326U	...	...	...
25	365S 326S	365 326U	...	...	...	...

†Totally-enclosed, non-ventilated.

*No previously assigned standard.

resin coatings on wire are thinner and better than old double-cotton covering. Synthetic material in slots, between phases and in connections and leads, is better and more compact. Synthetic varnishes more thoroughly impregnate, bind and protect windings.

A lesser mass of insulation now does a better job of protection; it not only saves space but it is impervious to most of the traditional insulation enemies . . . oils, chemicals and solvents.

Temperature Considerations — Even though the new materials can withstand much more temperature, they will still be working under present temperature ratings, considered liberal for even cotton and paper. Translated into performance, this should mean even longer insulation life under re-rating.

Heat transfer is another big consideration. Lesser mass of more dense insulation permits more copper to be put into stator slot with equal or better insulation. This in turn means better use of magnetic circuit. Another plus for the dense insulation is the elimination of trapped air space which slows heat transfer away from the windings and to the surface. Better lamination materials have reduced the heat that must be dissipated, so there is really a three-fold gain in heat transfer.

Metalworking Contributions — Thanks to improvements in metals and metalworking art, the last two design factors have been developed to a high level, too. The sheet metal of 1938 has been improved many times and lamination steel has outgrown the specialty mills until today it is a major product

of most steel producers. Amounts of copper and steel required to get given field strengths for specified ratings have been improved continuously.

Die casting under high pressures used today, along with some insulating tricks, produce rotors far superior to the 1938 units. Shell molding has come into the picture to give perfection in form and appearance. Nodular iron, with its desirable casting and working characteristics, is now a common commodity. Heat treatment of lamination steels adds to the effective use of a given amount by perfecting its interlaminar resistance. Added together, these advances are as much responsible for the smaller motor as any other item.

Production Timetable — Best NEMA estimates on availability of the various frame sizes are as follows:

Frame Numbers	Date
182 and 184	Jan. 1, 1954
213 and 215	June 1, 1954
254U and 256U	Nov. 1, 1954
284U and 286U	April 1, 1955
324U and 326U	Sept. 1, 1955

These are all open 4-pole polyphase induction motors under the new standards. Most motor manufacturers will continue to build both old and new frame sizes during a transition period which could vary for different manufacturers.

While NEMA members are not bound to follow the new standards it is generally believed that the vast majority will favor re-rating and, after a time, be producing none of the older frame sizes.

Paint Stops Fire Spread

Easily applied to all interior walls and ceiling areas by brush or spray, this fire retardant paint stops fire from spreading.

Because every drop of this paint is claimed to contain a mass of minute "built-in" fire extinguishers when exposed to flame Fyr-Kote pours out Carbon Dioxide and Calcium Chloride which smother fire and retards the spread of flame on the surface.

Fyr-Kote is manufactured by Morris Paint & Varnish Company, St. Louis.

Selection of Carbon Steel Bars

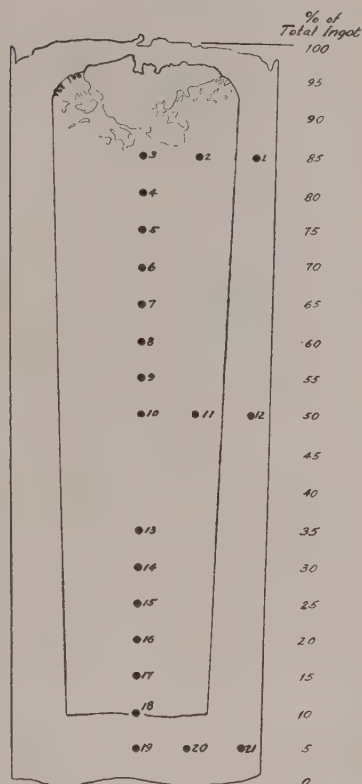


Fig. 1—Longitudinal sulphur print on left shows rim—lighter portion—and the core—darker portion—of a C1010 rimmed steel ingot

CHECK ANALYSIS OF CARBON, MANGANESE AND SULPHUR AT VARIOUS LOCATIONS IN INGOT USED FOR ROLLING INTO BAR PRODUCTS

Ladle analysis: Carbon 0.10; Manganese 0.41;
Phosphorus 0.020; Sulphur 0.030.

Location in Ingot

Check No.	Analysis			Cross Section	Length	Characterization
	C	Mn	S			
1	.06	.35	.020	Rim	Top	Low carbon & low sulphur
2	.11	.41	.054	Midway	Top	Sulphur segregation
3	.10	.39	.060	Center	Top	Sulphur segregation
10	.08	.38	.041	Center	50%	Intermediate sulphur segregation
11	.08	.39	.044	Midway	50%	Intermediate sulphur segregation
12	.07	.34	.020	Rim	50%	Low carbon & low sulphur
19	.06	.39	.020	Center	Bottom	Negative carbon & sulphur segregation
20	.06	.38	.021	Midway	Bottom	Negative carbon & sulphur segregation
21	.06	.37	.021	Rim	Bottom	Low carbon & low sulphur

Amount of oxygen in steel prior to or during casting will determine whether it is killed or nonkilled. Types are semi-killed, rimmed, killed, capped

By G. P. WITTEMAN
Assistant Metallurgical Engineer
Bethlehem Steel Co.
Bethlehem, Pa.

PART II

FUNDAMENTALLY, liquid steel is like charged water. In both there is an evolution of gas in the form of bubbles.

Primary reaction in liquid steel is the combination of carbon and oxygen to form a gas. If oxygen available for this reaction is not removed prior to or during casting (as by the addition of silicon or some other deoxidizer such as aluminum), gaseous products continue to evolve during solidification.

Proper control of the amount of gas evolution during solidification determines type of steel. If no gas is evolved, the steel is termed killed because it lies quietly in the mold. Increasing degrees of gas evolution result in semi-killed, capped or rimmed steel.

Rimmed — These steels may be identified by marked differences in chemical composition or contrast which prevails across the section and from top to bottom of the ingot, as shown by a macroetched specimen. The ductile outer rim, which etches light, is lower in carbon phosphorus and sulphur than the average chemical composition of the whole ingot. The inner portion or core, which etches darker, is higher than the average of the three elements.

This is illustrated by Fig. 1, which shows the cross section of a C1010 rimmed carbon steel ingot (22 inch x 25½ inch x 62 inch). Longitudinal sulphur print characterizes the rim—lighter portion—and the core—darker portion. Further identification of rim and core is apparent in drawing. Check concerns analyses of carbon, manganese and sulphur at the various lo-

cations in the ingot. These are summarized in accompanying table.

Limits — For carbon steels to effectively rim, chemical composition is restricted to carbon 0.25 per cent maximum and manganese 0.60 per cent maximum. Except for closing and welding of gas voids, the structural pattern of the ingot persists through the rolling process to the final product, and is readily revealed after hot acid etching.

Rimmed steel bar products, because of chemical composition, surface and other characteristics are used advantageously in the manufacture of finished products involving cold bending, cold forming or cold heading. Because of variables inherent in rimmed steels, they are not generally recommended for forging, hot upsetting, piercing, carburizing and heat treating applications.

Killed Steels—As killed carbon steels are usually deoxidized with silicon and/or aluminum, there is practically no evolution of gas during solidification. This contributes to a relatively high degree of uniformity of chemical composition and metallurgical properties. However, ingots, depending upon conditions, do indicate some variations in chemical composition from surface to center of cross section and from top to bottom.

Variations are illustrated in Fig. 2, showing a longitudinal sulphur print of a 22 inch x 25½ inch x 75 inch hot top ingot. Grade C1070. Ladle analysis is carbon 0.72, manganese 0.90, phosphorus 0.027, sulphur 0.040, silicon 0.30. The figure identifies check analyses locations—odd numbers center and even numbers midway. Accompanying table lists check analyses at the respective locations. Check No. 1, top center, carbon 0.79 per cent, indicates positive carbon segregation. Check No. 19, bottom center, car-

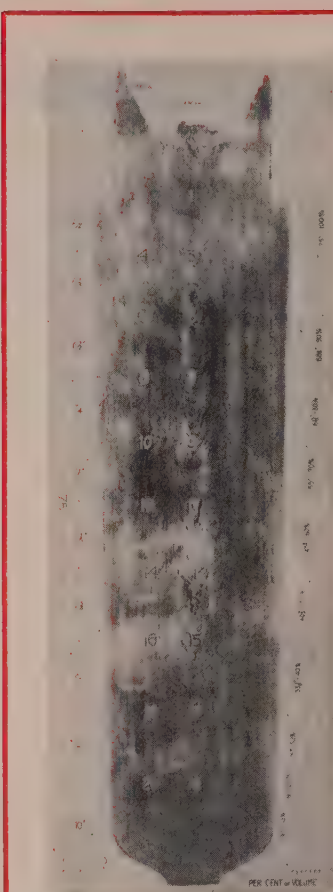


Fig. 2—This test shows variations in chemistry and properties of killed steel at various locations on ingot. User can specify grain size he desires

bon 0.69 per cent, indicates negative carbon segregation.

Shrinkage—Owing to the nature of solidification of killed carbon steels, there results a primary shrinkage cavity or pipe which is eliminated by discarding the affected part of the ingot during the blooming operation. Also, killed steels may have secondary pipe in addition to the primary pipe. It is best controlled by casting in big end-up ingot molds.

ANALYSIS

		C	Mn	P	S	Si
LADLE		72	90	027	040	30
CHECK	1	79	92	029	043	31
	2	73	90	028	040	31
	3	73	89	026	042	30
	4	74	90	027	043	33
	5	73	91	027	046	32
	6	75	90	027	041	32
	7	74	91	027	041	33
	8	73	90	027	042	33
	9	73	90	028	040	32
	10	74	90	028	041	32
	11	76	92	027	043	32
	12	73	89	027	040	31
	13	73	90	028	040	32
	14	74	90	028	041	32
	15	72	89	026	039	32
	16	72	91	026	038	32
	17	71	89	026	040	31
	18	73	90	027	040	31
	19	69	89	027	039	30
	20	72	90	026	040	31

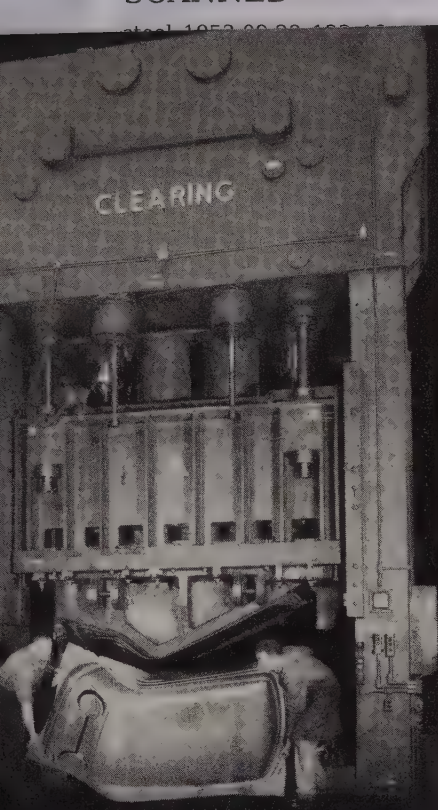
In big-end-up molds, the greater mass of metal at the top retards the solidification rate, as compared with the balance of the ingot. This factor, in combination with a hot top, generally confines primary and secondary pipe within the region of the hot top. Otherwise, depending upon conditions, carbon steels may be cast in big-end-up ingot molds without hot tops or in big-end-down ingots molds with or without hot tops.

Killed carbon steels for bar products are known for their uniformity of chemical composition and metallurgical properties. They are recommended for forging, hot upsetting, piercing, cold shaping, carburizing and heat treating applications.

Semi-killed—Semi-killed carbon steels are customarily deoxidized with lesser amounts of silicon and/or aluminum than are killed steels. Accordingly, semi-killed carbon

This is the second of three installments.

Previous installment covered the many considerations involved in the selection of bar products, including availability, combination grades, standard steels, and effect of constituents. Third and last installment next week will summarize engineering data with respect to given end uses.



a company is known
by the machinery
it keeps

Jarecki quality is built on men and machines.

Our men are expert craftsmen whose names
may never be news, but the names on Jarecki
machinery are known around the world.

Each is the finest product in its field.

We acknowledge our indebtedness to names

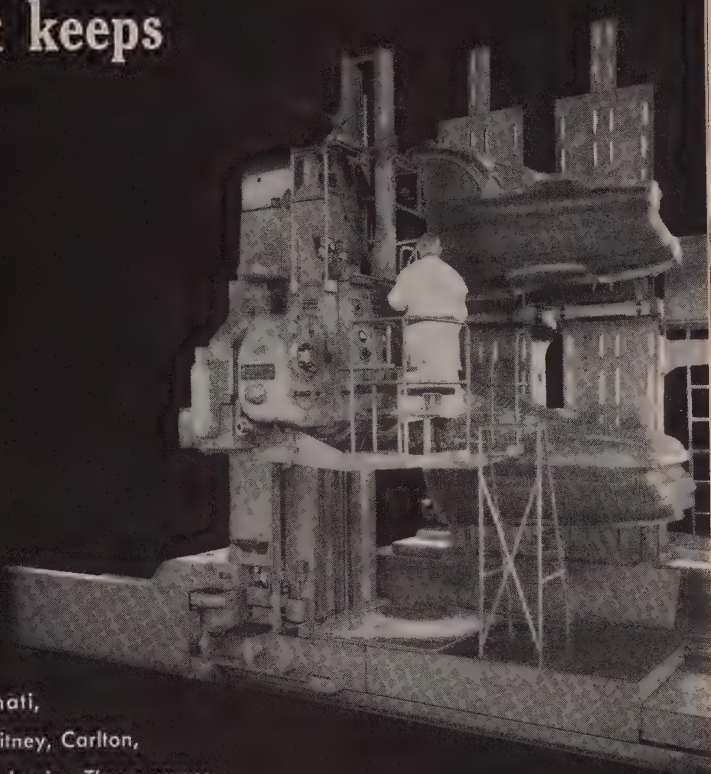
such as Clearing, Bliss, Donly, Cincinnati,

Kearney and Trecker, Pratt and Whitney, Carlton,

Mattison, and Giddings and Lewis. These names

and the machines behind them have helped to

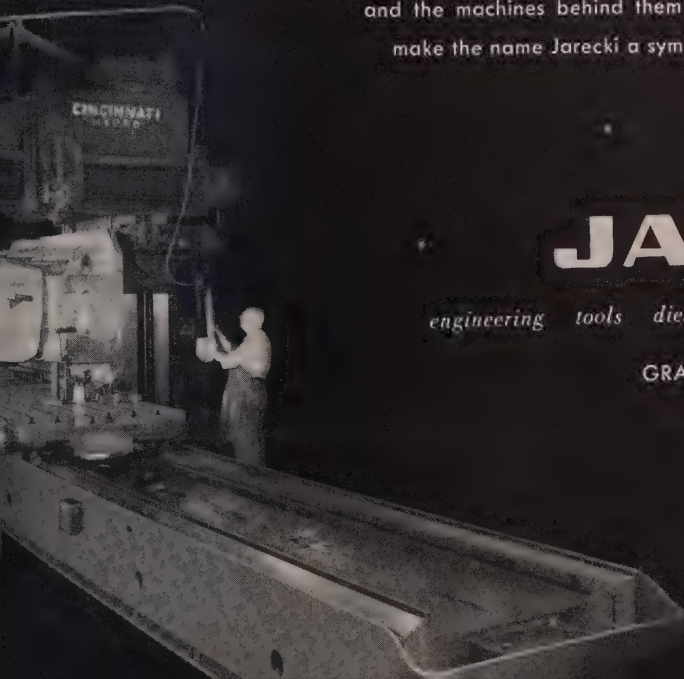
make the name Jarecki a symbol of dependability.



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To produce strip with precision accuracy, at high speeds and pressures, United Rolling Mills require close temperature control. Back-up roll bearings need a generous supply of properly cooled lube oil — *and get it!* In this mill oil cellar, as in others designed and built by United Engineering and Foundry Company, Ross Type CP Exchangers have been installed as original equipment. Temperature-safe lubrication is thus assured!

Unmatched for rugged dependability and high thermal efficiency, Ross Exchangers are on duty in practically every segment of the metal working industry: on engines, centrifugal pumps, compressors, hydraulic presses, die casting machines, speed increasers . . . and as quenching and cutting oil coolers.

Pre-engineering and full standardization make Ross Type CP Exchangers promptly available to meet most requirements. For more information, request Bulletin 2.1K1.



KEWANEE-ROSS CORPORATION

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

1431 WEST AVENUE • BUFFALO 13, N. Y.

In Canada: Kewanee-Ross of Canada Limited, Toronto 5, Ont.



Fig. 3—Here is a longitudinal sulphur print of a semi-killed ingot. Pipe cavity is shown in top region

steels have variations in uniformity. Their chemical composition and metallurgical properties are intermediate between those of rimmed and killed carbon steels.

During solidification of semi-killed carbon steels, there is evolved an amount of gas from within the body of the ingot. Depending upon degree of oxidation, this tends to compensate, entirely or in part, for the shrinkage that accompanies solidification.

Since pipe cavities are generally minimized, semi-killed carbon steels are normally cast in big-end-down molds without hot tops—sometimes referred to as open top. This is illustrated in Fig. 3, showing a longitudinal sulphur print of a semi-killed ingot, 22 x 25½ x 70

inches, with a pipe cavity in the top region.

Capped Steels—Term is derived from the method used in casting the ingot, which results in characteristics similar to rimmed steels, but the gradation is between rimmed and semi-killed steels.

During casting of the steel, a deoxidizer is sometimes added to effect a controlled rimming action. There may be a tendency for the steel to rise in the mold. This is due to the gas entrapped during solidification, which is in excess of that needed to counteract normal shrinkage. Time of gas evolution is limited by the capping operation, which retards the formation of an excessive number of gas voids within the ingot.

Capped steels are cast by two methods: 1. Bottle top molds using a heavy metal cap. 2. Big-end-down, open top molds. Here chemical cap is of aluminum or ferrosilicon.

By either method the capping operation is done just after the ingot mold is filled. Heavy metal cap is placed on the surface of the molten steel or sufficient quantities of aluminum or ferrosilicon are stirred on the surface of the molten steel. This causes the molten steel on the surface to be quiescent, thus promoting rapid solidification of the top. Consequently, capped steels do not segregate as much in the upper central portion of the ingot as do rimmed steels.

Capped steel bar products have surface quality equivalent to that of rimmed steel, and they are more uniform in chemical composition and other characteristics. In general, they may be used to better advantage when the material is subjected to cold bending and cold forming. Capped steels are not recommended for forging, piercing or heat treating applications.

Grain Size — Metallurgically, there are two distinct types of grain size, sometimes termed inherent grain size and apparent grain size. Inherent grain size, commonly known as the austenitic grain size, coarse or fine, may be controlled by the steelmaking practice.

Grades up to 0.28 carbon, which are designated as non-killed, cannot be specified to a controlled grain size, although they are gen-

erally coarse grain. Majority of the killed carbon grades for bar products may be specified coarse or fine grain—dependent upon the kind and amount of deoxidizer used in the steelmaking.

Coarse grain steels are usually deoxidized with fixed amounts of silicon. Fine grain steels are controlled by fixed amounts of aluminum or titanium, with or without the addition of silicon.

Grain Size Test—Common practice is to determine inherent or austenitic grain by the McQuaid-Ehn test or the oxidation method. Both are standardized in ASTM specification E-19. This test, by carburizing at 1700° F for 8 hours, determines grain size as classified by charts as coarse grain Nos. 1 to 5 and fine grain Nos. 6 to 8.

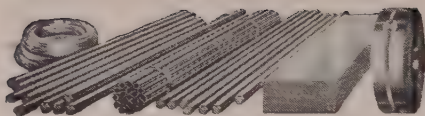
Basically, the test defines how the steel responds when carburized and correlates the deoxidation practice used in steelmaking. Thus, the steel can be classified for specific end uses, involving such things as forging, cold shaping, heat treatment and machining.

Fracture Test—Apparent grain size represents the true condition of the steel resulting from the following operations: As-rolled, as-forged, normalized, annealed, carburized, quenched and tempered or stress relieved.

Where possible, apparent grain size is revealed by a fracture test. Sometimes the P-F test (penetration-fracture) is used for grading of fractures. Variations are from No. 1 to No. 10 or No. 1 coarse, No. 5 intermediate and No. 10 fine.

Heat Treatment—Having been heated to an austenitizing temperature, coarse-grain steel will cool without appreciable transformation to the martensite-forming temperature. Fine-grained steel, with many grain nuclei, has a greater tendency, while passing through the knee of the S-curve, to transform to pearlite prior to reaching the martensite-forming temperature.

If carbon steels are to be properly applied to specific end uses, methods of fabrication, heat treatment, etc., the inherent grain size must be duly appraised. Assuming that the chemical composition, type and physical condition of the steel are the same, the inherent grain size exhibits some important characteristics.



BRIDGEPORT BRASS COMPANY

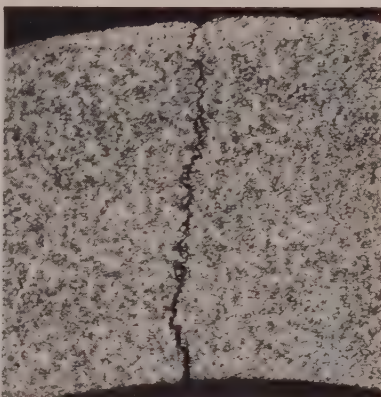
COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Heat crack resulting from deep drilling. Mag. 7x.

Transverse cross-section etch NH_4OH . Mag. 60x.

Heat Cracks Can Be Prevented Overheating During Machining of Brass Rod Harmful

High heat, developed from severe machining and drilling operations on leaded brass rod, but not satisfactorily carried away by the coolant-lubricant, may cause serious hot breaks or cracks on screw machined pieces. Such cracks are intercrystalline in nature and are usually distinguished by darkening or heat tinting on the edges of the cracks.

Causes of Overheating

It is considered good practice to maintain the coolant-lubricant at a temperature of 90°F or lower. If it rises above this value, its cause should be investigated. Cutting oil has been known to heat up to 112°F or higher after 1½ hours of continuous operation. Hot oil is obviously not a good cooling medium and indicates trouble. Overheating can result from the following:

1. Dull, improperly designed tools and broken drills.
2. Insufficient lubrication at the cutting zone.
3. Excessive machining feeds and speeds.

It is well known that dull tools require greater pressures and develop higher friction heat.

Deep drilling is particularly heat forming because it is difficult to cool the drill directly. This is aggravated

when operating with a broken drill which generates still greater friction.

Deep cuts and wide forming tools which remove considerable stock also create a large amount of heat. Sufficient side rake should be allowed to prevent burnishing the side of the metal being cut, another source of excessive heat.

Tool hardness is very important. The highest possible hardness without brittleness should be attained in order to prevent premature tool wear.

Keep Cool

Heat developed at the cutting zone should be dissipated rapidly by the coolant-lubricant. Insufficient cooling may be due to the fact that the stream of cooling liquid may be partially deflected by the chips curling above the tool, thereby preventing sufficient contact between coolant and cutting edges.

Faster cooling has been accomplished by spraying the coolant-lubricant from below to strike the underside of the cutting zone. The greater surface area of the coolant-lubricant spray particles is said to carry off the heat faster than the usual flooding from above. It also minimizes the tendency towards welding or the accumulation of deposits on the cutting edge of the tool.

When excessive heat is developed and cannot be removed quickly enough, it may be necessary to increase the cooling rate of the cutting fluid by increasing its volume.

Keeping both tool and work cool is the answer to rapid machining of hard, tough alloys like Duronze III (silicon aluminum bronze), which require more power and develop more heat than leaded brass rod.

Excessive Machine Speeds

Increasing machine speeds without corresponding modifications of the cooling procedure and coolant-lubricant composition may lead to overheating and possible cracking of machined pieces.

Ordinary cutting oils are capable of cooling work up to a certain machining speed. Beyond this point, the oil heats up. Increased cooling properties can sometimes be obtained by adding a percentage of kerosene or mineral seal oil. Changing to a good grade of water soluble fluid with better cooling properties than oil is sometimes helpful.

When high speed operation is the goal and the volume of work warrants it, the installation of a refrigerated central cooling system should be considered. Adequate cooling of tools and work means greater tool life and higher productivity.

Bridgeport's Technical Service

Modern engineering specifications call for a variety of alloys with special physical properties such as high tensile and yield strengths, great hardness, good corrosion resistance. Such materials may be difficult to machine unless special procedures are followed. Much information on the variety of screw machine alloys available and machining methods can be found in Bridgeport's "Technical Handbook."

Please consult our nearest district sales office in connection with your metal problems and requirements. For immediate deliveries, Bridgeport carries adequate stocks in its warehouses which serve the most active industrial centers.

(128)

CAUSES OF CORROSION

This article is one of a series of discussions by L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

COPPER-ZINC ALLOYS versus
SODIUM CHLORIDE SOLUTIONSCorrosiveness of Hot Sodium
Chloride Solution at 176° F

Corrosion tests similar to those described in last month's issue of this column were conducted in hot 2 N sodium chloride solution to determine the effect of temperature on the corrosion rates. The results of these tests are given in the table below.

Here again the straight copper-zinc alloys containing from 60% to 80% copper are more subject to high localized corrosion at the water line due to dezincification, substantiating the preference for the copper alloys containing 90% or more copper for use in sodium chloride solutions.

The data clearly show that the use of high-zinc alloys should be avoided in hot sodium chloride solutions since the rates of corrosion are relatively high, approaching that of low carbon steel.

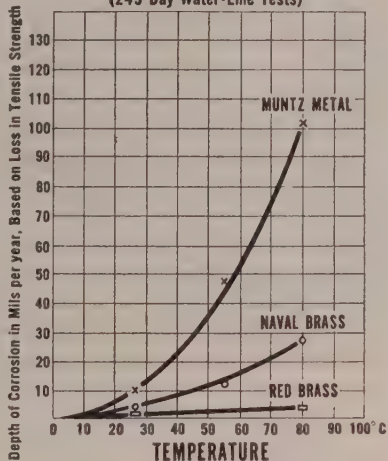
The alloying of the high-zinc brasses with tin or lead, while having some corrosion inhibiting value does not improve the corrosion resistance significantly towards hot sodium chloride solutions.

High Temperature Accelerates and
Low Temperature Decelerates
Corrosion

The effect of temperature can be seen by a comparison with the data presented here with those given in last month's issue of this column. The high-zinc alloys show a marked increase in the rate of dezincification at the water line (based on loss in tensile strength). For example, the 61% Cu, 39% Zn, 3/4% Sn; and the 60% Cu, 40% Zn brasses increased 6 and 11 times respectively when the temperature was increased from 80°F to 176°F. While the 85% Cu, 15% Zn alloy (Red Brass) showed only a twofold increase over the same temperature range.

It should be noted also that the Naval Brass, which contains 0.7% tin, had a rate of dezincification about one-third that of Muntz metal.

At lower temperatures the rate of dezincification is low and explains the

EFFECT OF TEMPERATURE ON CORROSION OF SEVERAL BRASSES in 2N Sodium Chloride Solutions
(249 Day Water-Line Tests)

long life obtained from Naval Brass and Muntz metal piping, tubing, plates, sheets, etc., used in contact with cooling brines. However, where the maximum resistance to dezincification is needed, copper, Red Brass, high-copper alloys and inhibited brasses should be used.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Foot Hydraulic Lift Truck designed to carry skids raises load platform by pressure on foot pedal. Light pressure on return lever is said to return load to floor level without dropping. Unit is said to be easy to maneuver in narrow aisles. Overall length, 49-in., width 14 or 18-in., platform height 7-in. in lowered position with lift through 1 3/4-in. Weighs 100 lbs. and has load rating to 1 1/2-ton. **No. 1326**

Coated Plug and Ring Gages are reported to have longer life, and to be corrosion resistant. Manufacturer coats gages to a thickness of 0.000025-in. Coating is said to be harder than hardened tool steel. **No. 1327**

Waterproof Pressure Sensitive Tape is reported to be useful for waterproof sealing of cartons and equipment. It is said to conform to government specification JAN-P-127, Type 1, Grade B, for industrial and defense use. **No. 1328**

Drive Stud Fastener is said to be useful in fastening light members (name plates, covers, brackets, etc.) to heavier parts. Light blows are said to drive stud home and secure parts. Grooves in the stud shank displace metal to form raised flute. When driven into holes of same nominal diameter as shank, flutes are compressed against wall, anchoring stud. Available in many sizes in round, flat and countersunk head styles. **No. 1329**

WATER LINE CORROSION OF COPPER-ZINC ALLOYS IN HOT 2 N
SODIUM CHLORIDE SOLUTION AT 176°F ± 9°F (249 DAY TEST)

Copper-Zinc Alloys	Depth of Corrosion Based on	
	Loss in Tensile Strength	Loss in Weight
100% Cu	.0064 ipy	.00491 ipy
90% Cu, 10% Zn	.0059	.00250
85% Cu, 15% Zn	.0064	.00240
80% Cu, 20% Zn	.0292	.00493
70% Cu, 30% Zn	.0520	.0071
65% Cu, 35% Zn	.0251	.00636
60% Cu, 40% Zn	.1131	.01085
Modified Copper-Zinc Alloys		
61% Cu, 39% Zn, 3/4% Sn	.0268 ipy	.00570 ipy
61% Cu, 39% Zn, 3/4% Sn, 0.07% As	.0676	.00586
61% Cu, 39.9% Zn, 3.1% Pb	.0564	.00684
59% Cu, 38.6% Zn, 2.09% Pb, 0.3% Sn	.0383	.00553
Other metals		
Low Carbon Steel (0.19% C, 0.8% Mn)	.0890 ipy	.0427 ipy
Aluminum Alloy (4.1% Cu, 0.7% Fe)	.2760	.0610

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS

BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
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Warehouse Service with Slitting Facilities in Principal Cities

(Advertisement)

REDUCING HEAT LOSSES

Furnace No. and Age in Weeks	No. of Cooling Units	Water Flow, gal/hr	Average Temperature Rise, °F.	Heat Losses		
				Therms/hr.*	% of Total Heat Loss	% of Total Heat Input
No. 1 (6)	Doors (5)	2,802	45.6	12.78	25.1	3.0
	Door frames (5)	10,584	25.0	26.51	52.0	6.2
	Gas port coolers (10)	3,378	34.3	11.59	22.9	2.8
	Total	16,764	30.4	50.88	100.0	12.0
No. 2 (7)	Doors (5)	8,988	21.9	19.72	18.1	5.0
	Door frames (5)	9,312	60.4	56.26	51.4	14.2
	Oil burner and tunnel coolers (4)	8,892	36.6	32.56	29.9	8.2
	Back-wall coolers (2)	1,068	6.5	0.69	0.6	0.2
	Total	28,260	38.7	109.23	100.0	27.6
No. 3 (16)	Doors (5)	14,622	11.9	17.42	25.8	4.7
	Door frames (5)	23,892	18.6	44.40	65.9	12.1
	Oil burner and tunnel coolers (4)	8,196	6.1	5.04	7.5	1.4
	Back-wall coolers (2)	2,760	1.8	0.50	0.8	0.1
	Total	49,470	13.6	67.36	100.0	18.3

*A therm is a unit of heat equal to 100,000 Btu's

How To Curb Heat Losses From Cooling Units

Large heat losses occurring in open-hearth furnace chills and door frames which are subjected to direct radiation or gas impingement can be curtailed by adequate protection with refractories

By A. M. FRANKAU
Plant Engineering Division
British Iron & Steel Research Association
London

WATER-COOLING losses are still a major item in the heat balance of an open-hearth furnace, and finality has not yet been reached in efforts to reduce these to a minimum. Water-cooling as such is not necessarily detrimental to the furnace.

When certain vital parts of the brickwork are protected in this way, more heat can be concentrated in the bath area, which may give greater production for a lower heat consumption per ton of product. It is more important to reduce direct heat losses to the cooling water than to reduce water-cooling.

Main Problem — Although the loss of heat to cooling water is the main problem, the supply and

pumping of the water involved is also important. For example, on several of the furnaces on which measurements were taken, more than 36 tons of water were circulated for every ton of steel produced.

In the range of temperatures normally used, the quantity of water flowing does not affect the heat losses, but it can have a considerable effect on the supply, pumping, and circulating costs.

Water-Coolers—Water-cooling is applied to open-hearth furnaces to protect refractories, to cool sliding surfaces, and to cool structural supports.

Cooling pipes fitted in gas ports are a good example of the direct use of water-cooling to protect re-

fractories. These pipes may be placed on the end of the nose of the port and covered by a thin layer of chrome paste. In practice, although they soon become partly exposed owing to the refractory falling away, they prevent serious erosion of the port and subsequent lack of control of the flame.

In arranging cooling units on a furnace, a balance is struck between the cost of heat being carried away continually in the cooling water and the cost of having the furnace out of production for repairs. Cooling units may therefore be used to insure that major parts of the furnace have about the same life.

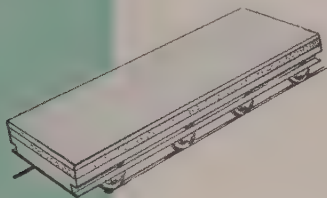
A summary of the water-cooling losses from three stationary furnaces

*These
performance
records
show why*

B&W

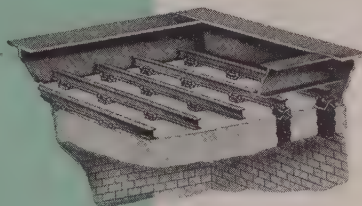
KAOCAST

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refractory
concrete*

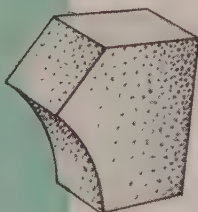


In a tunnel kiln car top, ordinary fireclay brick crumbled after a few trips . . . B&W Kaocast is still going after 400 trips without deterioration.

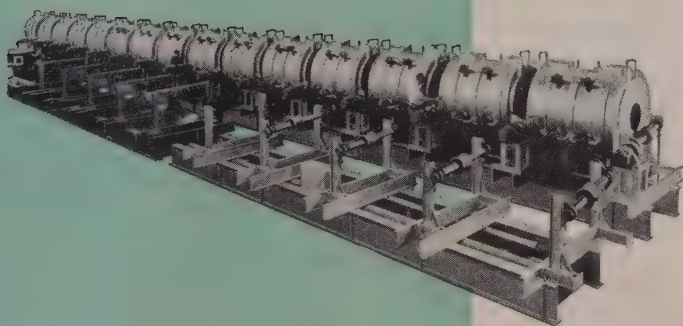
Another car top required maintenance after each cycle. After 8 months, B&W Kaocast was still in service . . . and required no maintenance whatsoever.



Used for soaking pit covers, B&W Kaocast reduced installation time over 80%.



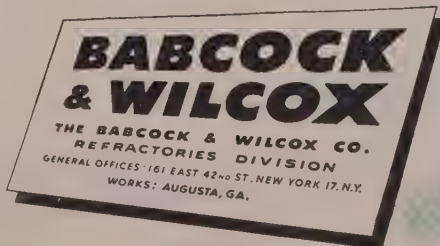
Special shapes of B&W Kaocast can be cast overnight to meet production demands. Kaocast is so versatile that many maintenance engineers keep a supply on hand for miscellaneous jobs.



In a GRADIATION* normalizing furnace, B&W Kaocast cut installation costs 25-28%, including the cost of reusable forms.

* TRADE MARK

For use at temperatures up to 3000 degrees, this refractory concrete can be molded, cast directly in place or applied with a cement gun. That's the "capsule story" of B&W Kaocast . . . the versatile refractory that furnace operators are putting to work in hundreds of applications to (1) cut installation costs, (2) lengthen furnace life. • Ask your B&W field representative for specific data.





Eight Open Hearths Bolster British Capacity

View of this open hearth shop shows a part of the facilities at Hawarden Bridge steelworks of John Summers & Sons Ltd., near Chester in northwest England where about 500,000 tons of capacity was added to British production. Operation of the eight 150-ton open hearths is under instrument control. Now in full operation, each furnace is rated at 2000 tons per week operating on hot metal

naces is presented in the accompanying table.

First Trial—Furnace in the first trial was of the venturi type, and was fired with a mixture of blast-furnace and coke-oven gas. The second furnace was also of the venturi type, but was fired with steam-atomized oil fuel. Its door frames were of the "archless" type, i.e., they had an additional cooled projecting ledge at the lintel to provide arch support. This almost certainly accounts for the increased heat losses from these units compared with the previous furnace. Largest contribution to the considerable heat losses from this furnace was from the tunnel coolers.

The third furnace tested was similar to the second, but was fired with a 50/50 mixture of tar and pitch creosote. In this case, even for an older furnace, the heat losses were much smaller. This might be due to a possible difference in furnace pressure, which would cause flame and hot gases to lick around the unprotected door frames and tunnel coolers of the second furnace.

Biggest heat losses seem to be caused by the door frames. The differences between these losses from the three trials are probably due mainly to the variations in design

and the corresponding surface areas that are subject to direct radiation from the furnace. The fuel used in firing the furnaces may also have some effect.

Lack of Protection—Results of these trials clearly indicate that the heat lost by cooling water is an important factor in furnace operation, and the major cause of heat losses was found to be lack of adequate refractory protection of the cooling units. Losses as high as 27½ per cent of the heat input were recorded, which represents an additional heat input of over 40 per cent necessitated by the cooling units.

Quantities of water used are necessarily large because of scaling and deposition problems, and this makes the temperature rise through the units small. Design of cooling units to take advantage of larger temperature rises with reduced water flow would effect a saving in pumping and supply costs.

Losses Tallied—For stationary furnaces, about 50 per cent of the total heat losses are accounted for by the door frames, the maximum value recorded for a single unit being 14.5 therms/hr. at a flow-rate of 1866 gal/hr and a temperature rise of 76.9° F.

An inch of refractory protection over a water-cooled surface can reduce the losses per hour from 196,000 to 23,000 Btu/sq ft. This provides evidence of the large losses that occur through exposed cooling units and of the importance of insuring refractory protection at all times.

The required heat input for given heat loss from the furnace chamber is shown to be in the ratio of 1.8:1 for oil firing. This means that any measured heat losses can be increased by at least one-half to give the heat input required.

Necessary Evil—It should not be thought, however, that water-cooling is an unnecessary evil in an open-hearth furnace. Water-cooling can and does play an important part in increasing the life of vulnerable parts of the furnace, and possibly allows harder driving. But these losses cannot be ignored, and every effort should be made to reduce them wherever the possibility presents itself.

Many units, such as chills and the inside surfaces of door frames, are never protected in any way, and it is suggested that the use of high magnesia ramming mixes on a welded stud foundation would help to give some protection.

Asbestos Packings

Industrial rod packings of braided asbestos, using an impregnation of 35 per cent Teflon (tetrafluoroethylene resin) are now being marketed by United States Rubber Co.

This type of packing, according to Elmer L. Spence, manager of mechanical packing sales, is expected to provide longer service than rod packings previously available because of its higher resistance to acids and alkalis.

The principal advantages of the resin for industrial packings is its high resistance to chemicals, including virtually all petroleum and coal/tar solvents. It will perform satisfactorily in temperatures ranging from -90° F to 500° F.

Two types of asbestos with tetrafluoroethylene will be supplied by U. S. Rubber. The white asbestos impregnated with the resin is designed for dilute acids, caustics and various chemicals on centrifugal or reciprocating pumps and valve stems.

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APPLICATIONS

HOW JOHN A. ROEBLING'S SONS CORP. SAVES \$8000. PER YEAR IN COST OF COOLING LADLES

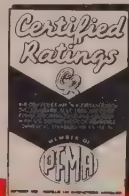
At the Roebling, New Jersey, mill of John A. Roebling's Sons Corporation, seventeen 45-ton ladles are kept busy in the production of carbon steel, from which the famous Roebling wire rope is made. After each heat, ladles must be cooled down from 2000° F and pouring nozzles installed.

Dissatisfied with the old method of using compressed air for cooling ladles, engineers at Roebling's conceived the idea of trying a DeBothezat "Hy-V" Air Jet to do the job. They selected a "Hy-V" Air Jet with 21" fan wheel and 1½ HP motor which produces 5600 CFM at a nozzle velocity of 4570 FPM, and it worked so well that Roebling has installed four more. Each is mounted on a swinging bracket and is equipped with special

nozzle extension so that air is discharged near the bottom of the ladle. Nozzle extension is retractable.

Here's what E. M. Yard, Roebling Combustion Engineer, has to say about the installation: "Nearly the full capacity of one 200 HP air compressor was previously used to do this job. The use of 'Hy-V' Air Jets means a power saving of probably \$8,000.00 per year. In addition, the installation of these fan units, at a total cost of about \$4,000.00 eliminated the need for additional air compressor capacity which would have cost \$16,000.00. These fan units will recover their cost in about six months from power savings alone."

Whether it's a question of cooling people or equipment, "Hy-V" Air Jets do the job efficiently and inexpensively. For detailed information, ask your DeBothezat representative or write our factory, Dept. S953, for catalog DH-8-51.



"HY-V" AIR JET

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DeBothezat Fans

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Association of Iron & Steel Engineers

Technical Program—1953 Convention

WILLIAM PENN HOTEL—PITTSBURGH

SEPTEMBER 28, 29, 30—OCTOBER 1

MONDAY, September 28

9 a.m.—Registration

Fort Duquesne Room

9:15 a.m.—Business Meeting

Urban Room

Conducted by President John L. Young

9:30 a.m.—Operating Practice Session

Monongahela Room

Chairmen: George Greene, assistant general manager, Bethlehem Steel Co., Johnstown, Pa., P. E. Thomas, assistant general superintendent, United States Steel Corp., Gary, Ind.

The Impact of Technological Developments in the Light Flat Rolled Steel Process on Consuming Industries, by William T. Hogan, S. J., professor of economics, Fordham University, New York.

Scrap Preparation and Scrap Contamination, by Robert F. Kuhnlein, superintendent of construction, Sheffield Steel Corp., Kansas City, Mo.

Modern Underground Coal Mining, by R. H. Knapp, chief engineer—coal, United States Steel Corp., Pittsburgh.

9:30 a.m.—Electrical Session

Urban Room

Chairmen: K. L. Johannsen, division superintendent, maintenance and utilities, United States Steel Corp., Morrisville, Pa., Robert S. Bogar, assistant to general manager, Bethlehem Steel Co., Bethlehem, Pa.

Grounded versus Ungrounded Low-voltage A-C Systems, by H. B. Thacker, distribution engineer, industry engineering dept., Westinghouse Electric Corp., Pittsburgh, Pa.

Cathodic Protection of Mill Grounding Systems, by J. F. Headlee, electrical design engineer, Construction Engineering Bureau, United States Steel Corp., Fairless Hills, Pa.

Integrated Electrical Equipment for Blast Furnaces, by C. P. Hamilton, application engineer, General Electric Co., Schenectady, N. Y.

2 p.m.—Mechanical Session

Monongahela Room

Chairmen: F. E. Robinson, assistant division engineer, American Steel & Wire Division, United States Steel Corp., Cleveland; E. C. Hite, assistant superintendent, maintenance, Timken Roller Bearing Co., Canton.

Foundation Design for Iron and Steel Plants, by G. S. Richardson, consulting engineer, Pittsburgh.

Water Supply for Steel Plants, by Ross Nebolsine, president, Hydrotech Corp., New York.

Ultrasonics in Maintenance Planning and Product Quality Control, by R. L. Rectenwald, president, Maintenance Engineering Corp., Pittsburgh.

2 p.m.—Open Hearth Session

Urban Room

Chairmen: G. H. Krapf, assistant chairman—Fuel and Power Committee, United States Steel Corp., Pittsburgh, E. H. Cauger, chief combustion engineer, Wheeling Steel Corp., Steubenville.

Improved Cleaning Techniques for Open hearth Checkers, by J. J. Enochs, sales engineer, Dowell, Inc., Wilmington, Del., and Reece Kincaid, sales engineer, Dowell, Inc., Chicago Heights, Ill.

Cleaning of Open Hearth Checkers and Sewers During Operation, by Robert M. Jordan, assistant superintendent No. 3 open hearth, Bethlehem Steel Co., Lackawanna, N. Y.

Republic's New Open Hearth Furnaces at Cleveland, by E. C. McDonald, superintendent, Combustion Dept., Republic Steel Corp., Cleveland.

New Open Hearth Furnaces at Stelco, by E. T. W. Bailey, chief combustion engineer, Steel Co. of Canada Ltd., Hamilton, Ontario.

9:30 p.m.—President's Reception and Informal Dance

Urban Room

AISE members and guests

TUESDAY, September 29

9 a.m.—Blast Furnace Refractories Session

Urban Room

Chairmen: C. G. Hogberg, assistant chairman—Blast Furnace Committee, United States Steel Corp., Pittsburgh. J. A. Bell, chief engineer, Bethlehem Steel Co., Bethlehem, Pa.

Temperature Distribution in the Hearths of Blast Furnaces, by Professor V. Paschkis, technical director, and Taghi Mirsepassi, research engineer, Heat and Mass Flow Analyzer Laboratory, Columbia University, New York.

Trends in Blast Furnace Linings, by Hobart M. Kranner, ceramic engineer, Bethlehem Steel Co., Bethlehem, Pa.

Bricklaying as a Factor in the Performance of Blast Furnace Linings, by W. S. Debenham, research associate, research and development, United States Steel Corp., Pittsburgh, Pa.


9 a.m.—Lubrication Session

Monongahela Room

Chairmen: C. A. Bailey, lubrication engineer, National Tube Div., Andrew E. Cichelli, lubrication engineer, Bethlehem Steel Co., Bethlehem, Pa.

Activated Alumina for the Maintenance of Gas Engine Crankcase Oils, by Lowrie B. Sargent, Jr., assistant chief, and E. M. Kipp, chief, lubricants division, Aluminum Research Laboratories, Aluminum Co. of America, New Kensington, Pa.

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illless Bearings—Their Place in Industry, by Charles D. Spadone, vice president, Spadone-Alfa Corp., New York, N. Y.

Application of Bronze Bearing Alloys, by James L. Duchene, sales representative, National Bearing Division, American Brake Shoe Co., Pittsburgh.

Amated Fabric Bearing Materials, by Richard L. Berry, manager, A-B-K Sales, American Brakeblok Division, American Brake Shoe Co., Detroit, Mich.

2 p.m. Materials Handling Session Monongahela Room

Chairman: Carleton Lord, materials handling engineer, United States Steel Corp., Pittsburgh, Pa.

Imported Ore Handling—Machines and Practices, by Erle M. Hayes, sales engineer, Crane & Bridge Dept., Engineering Works Division, Dravo Corp., Pittsburgh, Pa.

Intraplant Handling of Round Billets and Pipe with Special Automotive Equipment, by J. D. Tyson, superintendent, warehousing and shipping dept., National Tube Division, United States Steel Corp., Lorain, O.

Application of Self-Centering Rolls for Strip Processing Lines, by E. T. Lorig, chief development engineer, United States Steel Corp., Pittsburgh, Pa.

2 p.m.—Electrical Session Urban Room

Chairmen: D. C. McCrady, superintendent electrical dept., Steel Co. of Canada, Ltd., Hamilton, Ontario, R. T. Lucas, electrical superintendent, Weirton Steel Co., Weirton, W. Va.

System Engineering for Continuous Strip Processing Line, by J. S. Apperson, steel mill engineering, Industrial Engineering Section, General Electric Co., Schenectady, N. Y.

Temper Mill Control, by George P. Dirth, electrical engineer Granite City Steel Co., Granite City, Ill.

Estimating Motor Room Installation Costs, by Wray Dudley, chief consulting engineer, Pat-

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terson-Emerson-Comstock, Inc., Pittsburgh, Pa.

Crane Power Limit Switches, by Robert W. Graham, superintendent, electrical dept., Bethlehem Steel Co., Lackawanna, N. Y.

6 p.m.—Old Timers Dinner
Urban Room

WEDNESDAY, September 30

9 a.m.—Electric Furnace Session
Urban Room

Chairmen: A. K. Blough, superintendent No. 2 and 3 melt shops, Republic Steel Corp., Canton, O., Robert Sergeson, chief metallurgical engineer, Rotary Electric Steel Co., Detroit, Mich.

Growth Possibilities of Electric Furnace Carbon Steel, by W. C. Wheeler, management consultant, New York, N. Y.

Cost Comparisons of the Open Hearth and Electric Furnace, by David D. Moore, assistant supervisor, Engineering Economics Division, Battelle Memorial Institute, Columbus, O.

The Future of Large Electric Furnaces Compared to Modern Open Hearths, by Frank W. Brooke, Pittsburgh, Pa.

9 a.m.—Rolling Mill Session
Monongahela Room

Chairmen: Alex Montgomery Jr., assistant to vice president—rolling, United States Steel Corp., Pittsburgh, Pa.

The Direct Rolling of Carbon Steel Ingots to Plates on Three High and Four High Plate Mills, by Robert C. McMichael, supervisor 112-120-in. mills, Lukens Steel Co.

Recent Advancement in Continuous Butt Weld and Induction Weld Pipe Mills, by William Rodder, vice president engineering, Aetna-Standard Engineering Co., Pittsburgh, Pa.

Temperature Gradients and Stresses in Iron Work Rolls, by Charles F. Peck Jr., assistant professor, civil engineering, Carnegie Institute of Technology, Pittsburgh, Pa.

2 p.m.—Combustion Session
Monongahela Room

Chairmen: G. J. Gockstetter, dis-

trict combustion engineer, Republic Steel Corp., Chicago, Ill., A. F. Kritscher, assistant chief engineer, Process Development, National Tube Division, United States Steel Corp., Pittsburgh, Pa.

Progress in the Development and Application of Metallic Recuperators in the Steel Industry, by E. A. Vierow, superintendent, fuel and power dept., Youngstown, O.

New Soaking Pit Facilities at Ford Motor Co. Steel Division, by B. D. Barns, supervisor, and H. E. Raaflaub, senior fuel & utilities engineer, fuel & utilities dept., Steel Division, Ford Motor Co., Dearborn, Mich.

Heat Processing in Industry—Facts and Figures, by Frederic O. Hess, president, Selas Corp. of America, Philadelphia, Pa.

2 p.m.—Electrical Session
Urban Room

Chairmen: F. H. Wickline, electrical engineer, National Tube Division, United States Steel Corp., Pittsburgh, Pa. George A. Kaufman, chief electrical engineer, Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Modern Arc Furnace Equipment and Practices, by E. H. Browning, steel mill engineer, metal working section, Westinghouse Electric Corp., Pittsburgh, Pa.

The Determination of Optimum Current in an Arc Furnace, by W. E. Schwabe, research engineer, National Carbon Research Laboratories, Cleveland, O.

Problems in Supplying Power to Electric Furnaces, by George E. Duerr, industrial sales manager, West Penn Power Co., Pittsburgh, Pa.

7 p.m.—Formal Dinner
Ball Room

10 p.m.—Dance
Urban Room

AISE members and guests. No admission charge.

THURSDAY, October 1

9 a.m.—Combustion Session
Urban Room

Chairmen: F. B. Bevelheimer, power and fuel engineer, Ford Motor

Co., Dearborn, Mich., R. A. Lambert, superintendent, steam and combustion, Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Studies on Provision and Use of Oxygen in Steel Plants, by Glen O. Carter, partner, Percival R. Moses & Associates, consulting engineers, New York, N. Y.

Use of Plastic, Castable and Gunning Materials in Soaking Pits, by W. D. Rees, superintendent, bar and blooming mill, Sharon Steel Corp., Lowellville, O.

Combination Fuel Firing for High Pressure Boilers, by C. J. Webster, fuel engineer, National Tube Division, United States Steel Corp., McKeesport, Pa.

9 a.m.—Lubrication Session
Monongahela Room

Chairmen: D. E. Whitehead, general lubrication engineer, Crucible Steel Co. of America, Pittsburgh, Pa., W. M. Schuck, Lubrication Engineer, Armco Steel Corp., Middletown, O.

Factors Affecting Performance of High Temperature Greases, by Eldon L. Armstrong, research associate, Socony-Vacuum Laboratories, technical service dept., Brooklyn, N. Y.

Pumpability of Steel Mill Grease, by Joseph S. Aarons, lubricants chemist, National Tube Div., United States Steel Corp., Pittsburgh, Pa. Richard G. Warren, lubrication engineer, United States Steel Corp., Homestead, Pa., and J. J. Seaton, laboratory technician, National Tube Division, United States Steel Corp., Pittsburgh, Pa.

Steel Mill Lubrication Problems, by A. C. Keiser Jr., supervising lubrication engineer, Birmingham, and E. E. Perso, supervising lubrication engineer, Texas Co., Los Angeles, Calif.; W. H. Mandy, engineering representative, Texas Co., New York; and M. S. Clark, chemist, technical and research division, Texas Co., New York.

1:30 p.m.—Inspection Trip
Pittsburgh Works, Jones & Laughlin Steel Corp.

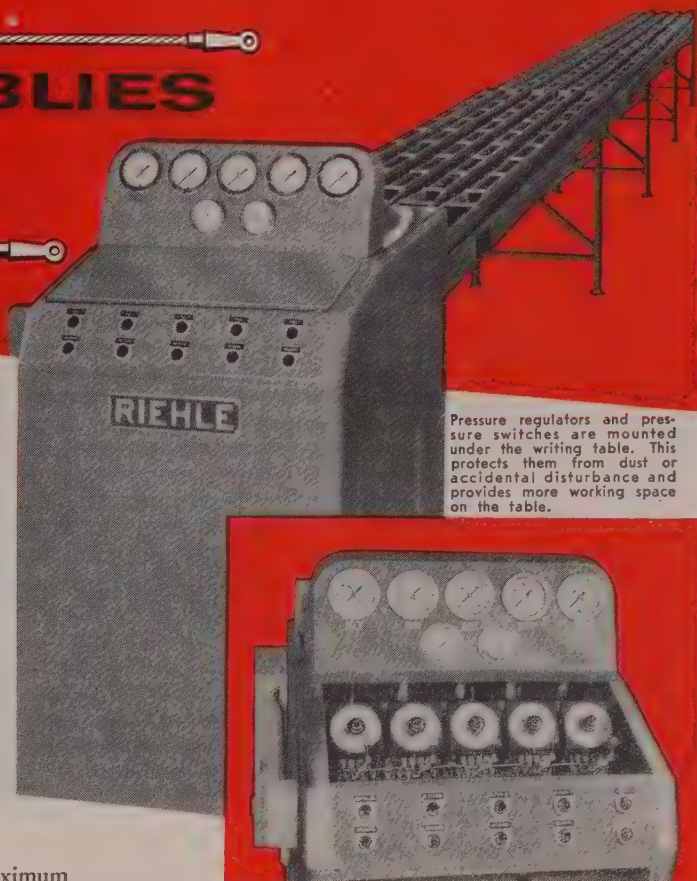
This trip will include the open hearth shop and blooming mill, as well as the strip mill.

TEST AIRCRAFT CABLE ASSEMBLIES FASTER

Up to five aircraft cables can be pre-stressed and proof-loaded at various loads and at one time on this new Riehle Aircraft Cable Tester.

By a turn of a handwheel, loads can be adjusted to any desired point within the range of the machine.

The duration and strain at each test station is preset on adjusters mounted under the writing table. After setting, the machine is operated by simply pressing the buttons on the console. When maximum strain has been exerted for the preset time interval, the machine automatically releases the load. After the load is released, the timers automatically reset to zero for the next test. The strain on each cable is recorded on large easy-to-read dials. Each dial has two hands; one records strain at any time and the other records the maximum.



Pressure regulators and pressure switches are mounted under the writing table. This protects them from dust or accidental disturbance and provides more working space on the table.

The mooring table accommodates up to 50-foot lengths of cable. Tables for longer cable lengths are available. Safety guards are the open type so that the cable may be conveniently inserted.

The Riehle Aircraft Cable Proof Tester meets all specifications of the Bureau of Naval Aeronautics.

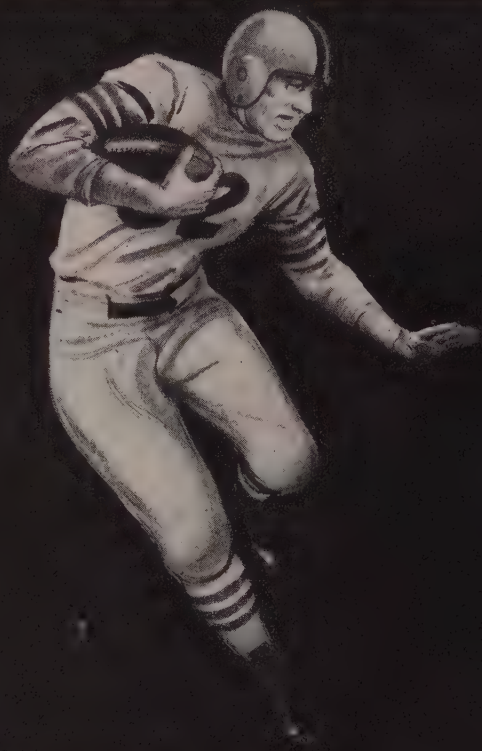
WRITE FOR LITERATURE, SPECIFICATIONS AND PRICES

RIEHLE TESTING MACHINES

Division of American Machine and Metals, Inc.
EAST MOLINE, ILLINOIS

"ONE TEST IS WORTH A THOUSAND EXPERT OPINIONS"

Just as a football player needs protection . . .



IRON and STEEL
Need **PROTECTION**

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant



galvanizing . . . pickling . . . painting . . . oiling

IN THE HEART
OF THE STEEL INDUSTRY

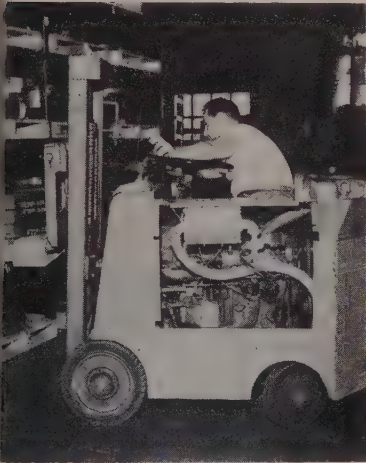


o Indoor Exhaust Woes

Replacing lift truck engine mufflers with Oxycat units makes exhaust harmless and odorless

PROBLEM of operating gasoline powered fork lift trucks indoors without danger to employee health was solved by Monroe Calculating Co. when they equipped their units with catalytic exhausts.

When Monroe decided to use fork lift trucks to speed up materials handling at their Orange, N. J., warehouse, it found that from a cost standpoint, gasoline-powered trucks held many advantages. Because the trucks would operate indoors for long periods, management feared that dangerous concentrations of carbon monoxide



CATALYST UNIT DOES TRICK
... tames CO exhaust gases

and other noxious exhaust gases might build up and prove to be a health hazard.

Solution in Mufflers—The problem was solved by replacing the regular truck mufflers with OCM catalytic exhausts. These units, manufactured by Oxy-Catalyst Inc., Wayne, Pa., oxidize more than 95 per cent of the carbon monoxide and hydrocarbons in the truck exhaust, turning them into harmless carbon dioxide and water vapor.

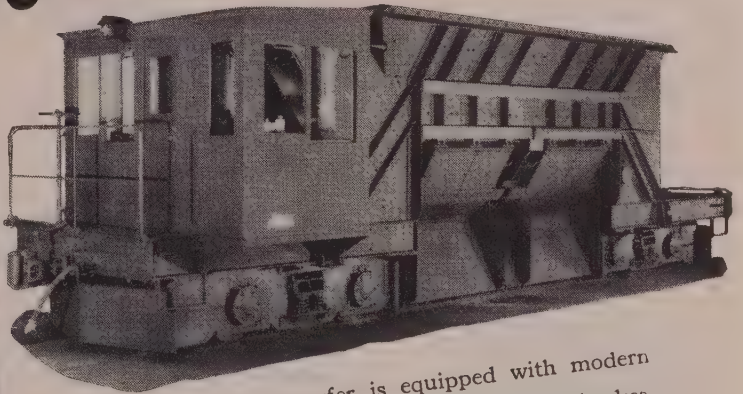
The gasoline-powered trucks proved economical and easy to maintain and have ample reserve power for handling heavy loads of strip, bar and coil steel. At the same time, the OCM catalytic ex-



of the "HIGHLINE" ATLAS ore transfers

We've been building transfers longer than we care to remember . . . most of them are still running. They are the "Star" performers on the highline. We're proud of their ability to meet specific performance requirements of our customers.

50-TON ORE TRANSFER



This Atlas Ore Transfer is equipped with modern hydraulically operated discharge gates and brakes. Steel plate trucks are provided. The cab is overhung at one side to give the operator a line of vision along-side the car. The car is equipped with electric space heaters.



Scale Cars



Coke Quenchers



THE ATLAS CAR & MFG. CO.

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

Make Wolverine **THE** source

Here at Wolverine are specialists trained in the production, handling, and fabrication of tubular parts.

They know not only how to produce tube and fabricate it into various shapes for your specific purposes, but they are also familiar with its ultimate uses and the manifold conditions under which tubes normally function.

On these pages are a few concise examples that will serve to show how Wolverine is prepared to contribute substantially in making your operations more profitable.

The use of any of these products or processes will bring you one or more of these advantages which you can pass on to your customers:

DECREASE PRODUCTION COSTS
REDUCE MAINTENANCE COSTS
IMPROVE YOUR PRODUCT
SAVE SPACE THROUGH GREATER COMPACTNESS
INCREASE OPERATING EFFICIENCY

WOLVERINE TRUFIN*

— the integral finned tube



Trufin is recognized for its exceptionally wide range of outside-to-inside surface ratios —thus highly efficient in many heat transfer applications.

Because the fins are extruded from the tube wall itself (actually one and the same piece of metal), vibration or sudden changes of temperature cannot affect the efficiency of the tube.

Choose from wide range of sizes and fin spacings in copper, copper base alloys, aluminum, 1010 welded steel and type 304 stainless steel and also in bi-metal (aluminum fins and copper liners. Liners of other alloys can also be used).

* REG. U. S. PAT. OFF.

Wolverine Trufin and the Wolverine Spun End Process available in Canada through the Unifin Tube Co., London, Ontario.

PARTS

MADE BY OUR

SPUN END

PROCESS†

Countless numbers of tubular parts can be produced better and more economically by the Spun End Process—a unique and very efficient development of Wolverine's. Its adaptation carries with it additional economies beyond its initial production. Fewer assemblies are needed—often entirely eliminated. Range of forms almost unlimited. Send for our Spun End Process brochure and learn how this process can help you.

†A PATENTED PROCESS RE. 22465



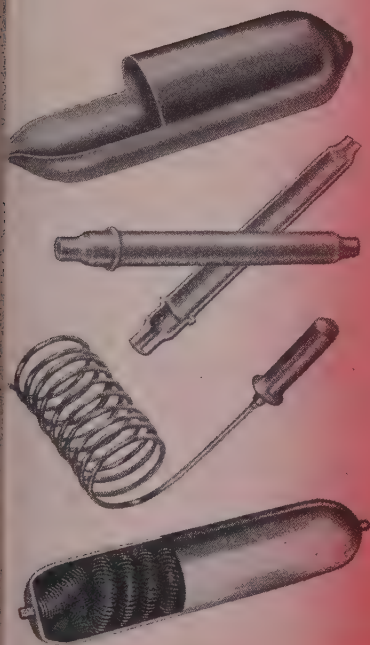
for all your tube requirements

The same tubemanship that has been producing Wolverine nonferrous tubing now for over three decades and is responsible for the high quality that has given Wolverine the reputation it enjoys is being devoted also to the manufacture of still another Wolverine product—

ELECTRIC-WELDED STEEL TUBE

You can buy Wolverine Electric-welded steel tube with the same degree of confidence that you have enjoyed when purchasing our nonferrous tube.

We like to have you think of us as tube specialists. When you think of tube and its uses, always think of Wolverine.



FABRICATED TUBULAR PARTS

Avail yourself of the facilities—skill and equipment—that Wolverine has to fabricate tubular parts to meet your requirements.

To name a few—bending, brazing, beading, flaring, soldering, swaging, spinning, expanding, coiling, finning, threading, cutting, annealing.

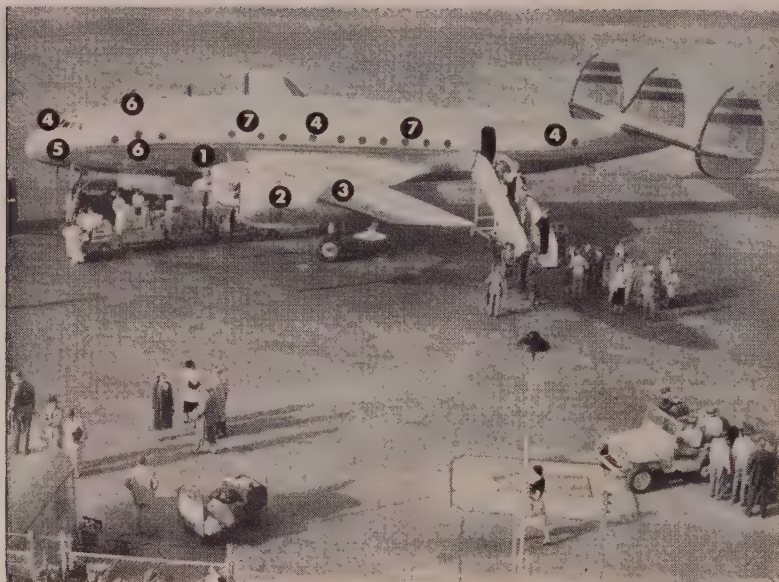


WOLVERINE TUBE DIVISION of CALUMET & HECLA, INC.

Manufacturers of Quality-Controlled Tubing
1439 CENTRAL AVENUE • DETROIT 9, MICHIGAN

Plants in Detroit, Mich. & Decatur, Ala. Sales offices in Principal Cities





When parts must function repeatedly without fail, aircraft designers specify beryllium copper, a unique alloy with a multitude of desirable properties. This Lockheed Constellation serves to show where beryllium copper parts can be found in many modern airliners. For parts, see below.

VERSATILE BERYLLIUM COPPER

The aircraft industry makes wide use of this alloy's ability to do many jobs

In World War II, Berylco beryllium copper was drafted for the production war on many fronts. It did amazingly well. For aircraft, it improved such things as radar equipment, altimeters, valve guides, plug type connectors.

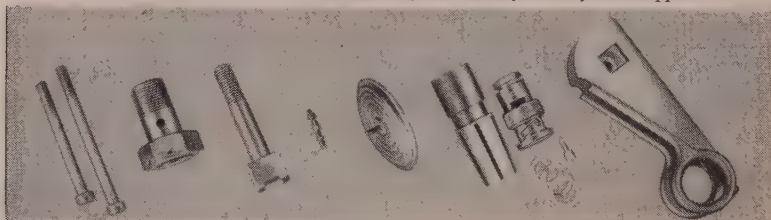
Today Berylco beryllium copper is an engineering material in wide demand—one of growing value to the aircraft industry. It is being used more and more for critical engine parts, from bushings to jet fuel pumps. Its use results in better airframe components as well as more accurate instruments. It helps solve increasingly tough radar and electronics problems.

In fact, nearly every industry today is aware of the part Berylco

can play in making better, cheaper products. By offering the designer combinations of such desirable properties as elasticity, fatigue resistance, strength and conductivity, Berylco can often solve design problems involving conflicting requirements. And it can do so at low cost and with the utmost reliability.

The supply picture today is brighter than ever before. Now you can be certain of getting the material you need for *your* application. You can also, for the cost of a phone call, get the know-how and experience of the world's largest producer of beryllium copper. For full information, address your inquiry to THE BERYLLIUM CORPORATION, Dept. 3I, Reading 19, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper



These Berylco parts—a few of those used in modern planes—are numbered to indicate where they appear in the large photograph. (1) Propeller bolts; (2) fuel injector; (3) de-icing stud; (4) instrument switch part; (5) instrument diaphragm; (6) connectors, plug-type and coaxial; (7) safety belt release.

haust has maintained clean, safe air in even the most confined areas, and not one case of nausea, headache or other complaint was received.

How It Works—Heart of the catalytic exhaust is the cartridge of spaced porcelain rods coated with a catalytic agent—catalytic alumina and platinum alloy. The engine exhaust flows across the surface of these rods where combustion of the carbon monoxide and other harmful vapors takes place.

On leaving the catalyst the exhaust contains mostly carbon dioxide and water vapor. The slight trace of contaminants remaining is far below the U. S. Public Health Service tolerance of 100 ppm for eight hour exposure and 400 ppm for one hour exposure.

Any Engine—Exhaust unit can be used on any engine—mobile or stationary—which burns unleaded gas, and it can also be easily adapted to LP engines. It successfully prevents the harmful psychological and physiological symptoms of excess carbon monoxide.

OCM catalytic exhausts come in standard sizes for any make or size of fork lift trucks. Space requirements for installation of a unit are approximately the same as for the regular muffler which it replaces.

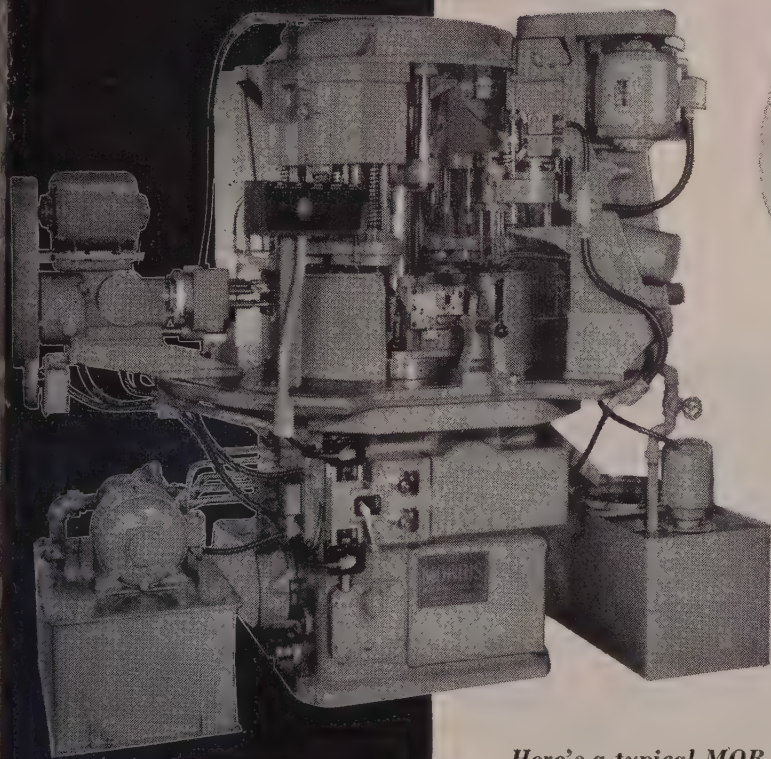
Versatile Broaching Machine

A versatile air-powered broaching fixture designed to cut broaching equipment costs and speed delivery is announced by National Broach & Machine Co., Detroit. The horizontal self-contained fixture will broach holes, keyways and contours on a wide variety of production parts. The compact fixture consists of a cast iron base with two integral vertical flanges. A 5-inch diameter air-hydraulic cylinder having a 25-inch stroke is mounted on a flange at one end of the base. The other flange in the middle of the base supports the work rest plate. Two hardened and ground steel guide bars supported by the two flanges guide an automatic broach puller mounted on the end of the air cylinder rod.

Linear ball bushings are provided in the puller head guide holes to promote long wear life and reduce friction loads.

how **little** does it cost...

to get
"special
machine"
production
with
combination
standard
units?



Producing 170 finished transmission control valve bodies per hour at 100% efficiency, this machine performs 32 drilling and tapping operations in two cycles.

Here's a typical MOR-SPEED answer to an ever-more important problem:

A combination of Morris standard units . . . center column, base, indexing mechanism and hydraulic units . . . plus a made-to-order vertical and auxiliary side heads . . . make up this high production machine. Cost is less, delivery faster . . . the user gets the accuracy and low cost production of a "special" without the usual sky-high costs and limited application of conventional units.

Consider the multiple savings . . . investment, labor, time and floor space . . . of MOR-SPEED multiple machining. Let Morris Engineers prove that high production and precision can be yours for less than you might imagine.

a better product
at less cost
with precision
- plus production



Morris

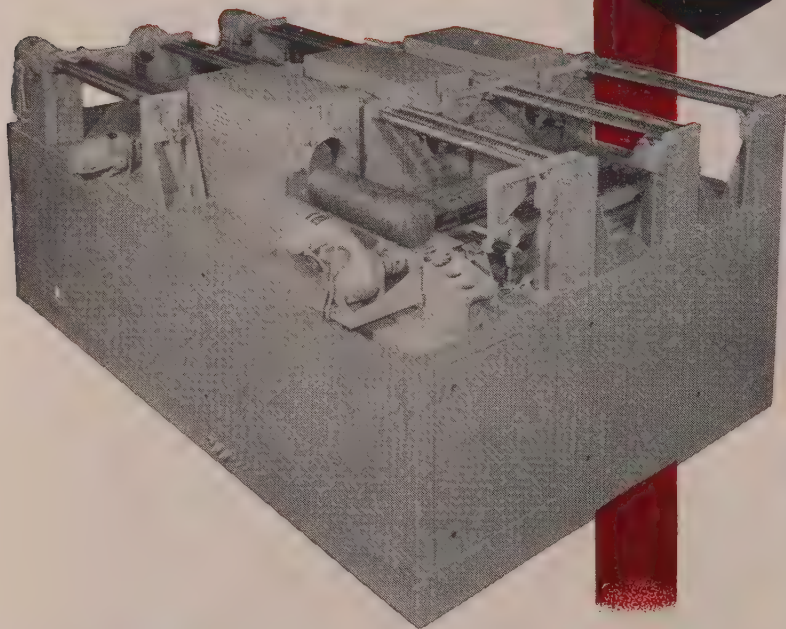
THE MORRIS MACHINE TOOL CO.

941 HARRIET ST., CINCINNATI 3, OHIO

the first
completely
universal....

BILLET HEATER

60-cycle
induction



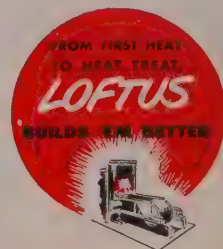
THIS Loftus Universal Thermo-Induction furnace is the most flexible 60-cycle billet heater ever designed. You can heat every non-ferrous metal, in the same furnace, either consecutively or simultaneously, to its respective forging or extrusion temperature. The unit maintains

efficiency, constantly, even when heating short-length billets.

Loftus Thermo-Induction gives you the most practical, dependable, and efficient method of heating non-ferrous metals.

achieve uniform heating in a matter of seconds. Production is continuous, and completely automatic. The press operator controls the furnace. Separate, positive control of each coil is at fingertips.

The Loftus 60-cycle Thermo-Induction Billet Heater illustrated is designed to heat copper, aluminum, and cupro-nickel for extrusion purposes. The unit is readily adaptable for forging and rolling processes. It is possible, with this billet heater to heat a 6" dia. Aluminum billet to 800° F., an 8" dia. brass billet to 1550° F., and a 10" dia. nickel billet to 1950° ALL AT THE SAME TIME IN THE ONE FURNACE. Each billet is heated independently . . . from a single control

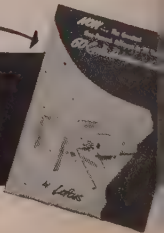


Send Today for Booklet describing Loftus
60 Cycle Induction Heating in Detail

Loftus

ENGINEERING CORPORATION
Designers and Builders of Industrial Furnaces

610 Smithfield Street • Pittsburgh 22, Pennsylvania



NEW

PRODUCTS and equipment

Reply card on page 161 will bring you more information on any new products and equipment in this issue

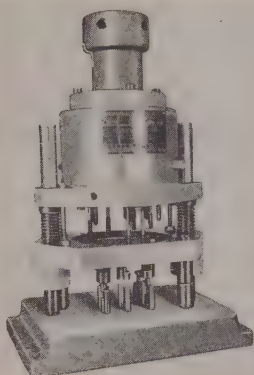
Three-Phase Spot Welder

... 1500-4000-pound force

SPT 2 welding machine is one of series of three-phase spot welders available in 50, 75 and 100 kva at 10 per cent duty cycle. Model can be supplied in 18 to 60-inch throat depth and 1500 to 4000-pound maximum electrode force.

Welder will accommodate large production runs on two thicknesses of clean mild steel in minimum

to perform drilling, reaming and tapping on standard presses and tapping machines. Four types accommodate various work piece



sizes, handling hole patterns from 3 to 15 inches in diameter.

When used on drill presses equipped with power feeds and automatic cycling, units achieve maximum production because the operator handles parts only. Standardization is important because only a few parts need to be engineered and specially made. Zagar Tool Inc., Dept. ST, 24000 Lakeland Blvd., Cleveland 23, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

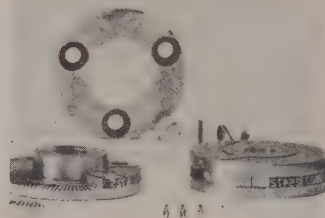
Steel Roller Stamp

... permanent metal marking

This steel roller stamp is adaptable for use in regular marking machines, ordinary screw machines or lathes. It is precision made, allows the user to select and vary information to be marked by means of interchangeable tapered type inserts supplied with the holder. Retaining ring fits over the type inserts and holds them in place, yet provides for quick and easy changes.

Special locking feature of the

Roliner marker prevents type slippage that sometimes results from hard and repeated roller marking.



Acme Marking Equipment Co., Dept. ST, 8030 Lyndon, Detroit 21, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Infra-Red Oven

... for large-area applications

This infra-red oven is designed for larger installations, and is equally well suited for both conveyorized and nonconveyorized batch oven work. Design permits tight multiple section joints, with each section individually adjustable from the outside. Each lamp row has two complete panels of asbestos - insulated metal - backed construction to retain heat.

Oven is installed so contour can be changed while it is in actual operation. Thus every lamp in the oven can be positioned directly to the work. An occasional wiping of lamp bulb faces is the only cleaning required. Wil-Son Mfg. Co., Dept. ST, Cloverport, Ky.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Hydraulic Accumulator

... single and double shell

Cylindrical type hydraulic accumulator units are made in both single and double shell construction and are recommended for in-



0.020 and maximum 0.102-inch gages. In stainless, it takes minimum 0.020 and maximum 0.062-inch; in aluminum, minimum 0.025 and maximum 0.072-inch. Model can also weld many other types of materials and alloys, such as brass, verdur, heat resistant alloys, coated steel, etc., within limits of electrode force and secondary current. Sciaky Bros. Inc., Dept. ST, 915 W. 67th St., Chicago 38, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Self-Cleaning Drill Jigs

... entire line standardized

Complete standardized line of self-clamping drill jigs is developed for use in conjunction with the manufacturer's gearless multiple spindle drill heads. These jigs can be used with the drill heads

stallations involving pressures up to 3000 psi. Design conforms to Military spec drawing MS 28700; units meet requirements of MIL-A-5498.

Design features include pressure-balanced inner cylinder, free-floating piston, warning vents and



forged end caps with internal threads. Sizes range from 12½-inch over-all, 2¼-inch cylinder and 8 13/16-inch stroke to 33 3/8-inch over-all, 4½-inch cylinder and 27 7/8-inch stroke. Parker Aircraft Co., Dept. ST, 5827 W. Century Blvd., Los Angeles, 45, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Ultraviolet Instrument

... fast flaw or crack tests

Compact Blacklight Wand model is an addition to the manufacturer's series of Fluoretor portable ultraviolet instruments. The instrument is a tubular unit resembling



large flashlight in appearance. Size reduction of electronic components has enabled comparable reduction of total weight to only 1¾ pounds.

Factors of ready portability and independence from normal power outlets make the instrument particularly useful in field work on such jobs as materials testing. Menlo Research Laboratory, Dept. ST, Box 522, Menlo Park, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Dew Point Controller

... completely automatic cycles

Automatic controller regulates dew point in controlled atmosphere metal treating furnaces. Self-contained unit operates electronically, continuously recording and controlling. The instrument makes

possible completely automatic heat-treating cycles such as carburizing and carbon restoration.

Adjustable to meet any required



dew point within capacity of the particular furnace to which it is attached, the controller pumps furnace atmosphere through a 5/16-inch steel tube. Cooling element condenses water on a measuring device; condensation temperature is then measured. Ammonia in furnace atmosphere does not harm or affect accuracy. Instrument requires no calibrating. Ipsen Industries Inc., Dept. ST, 715 Main St., Rockford, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Industrial Scale Line

... no more hand adjustment

Full range of models from bench to motor truck scales features one-piece sectors in full-floating



double pendulum mechanism. This construction is reported to increase precision and strength, and eliminate hand adjustment.

Indicating hands can be installed to face any one of eight different directions; or a scale can be ordered with head that swivels through complete 360 degrees.

Improvements in the portable

model include 18 per cent large platform, with over-all dimension of scale base reduced and wheel within base dimensions. Bench models have 31 per cent large platforms, reduced over-all scale width and depth. Toledo Scale Co., Dept. ST, Telegraph Rd., Toledo 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Battery-Operated Hoists

... truck-mount application

Line of battery-operated Budgit hoists is developed especially for mounting on trucks to make available on-the-spot lifting wherever



needed. Hoists can be installed on trucks equipped with a 6-v electrical system by adding another 6-v battery. Units are available in capacities of 1000, 2000 and 4000 pounds. Shaw-Box Crane & Hoist Division, Manning, Maxwell & Moore Inc., Dept. ST, Muskegon, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Fire-Preventive Parts Cleaner

... placed wherever convenient

Foot treadle fire-preventive dip tank for washing castings, parts assemblies and similar moderate

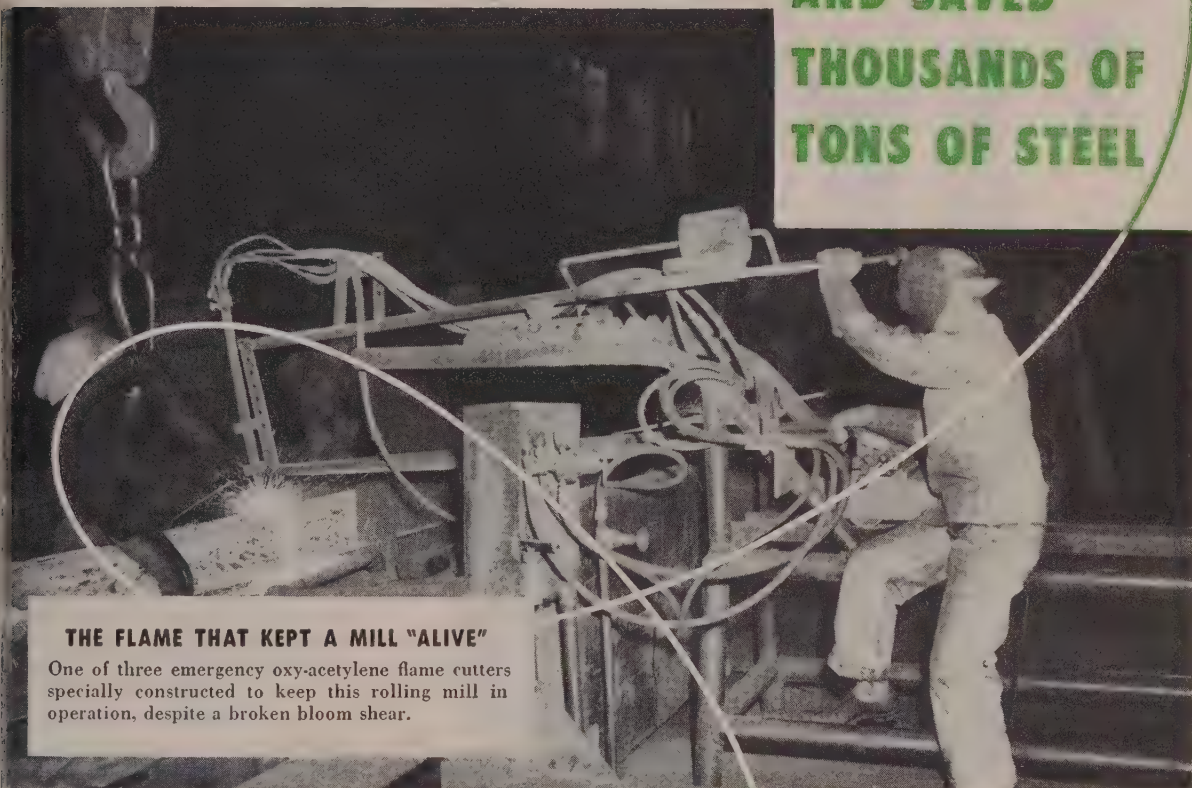


size production pieces can be placed safely beside a worker at any plant location where convenience dictates. Dip tank is waist high for use without bending.

SCIENTIFIC
Steel 1052-00-00-100-100

How Oxygen...and **LINDE SERVICE*** HELPED PREVENT A MILL SHUTDOWN...

**AND SAVED
THOUSANDS OF
TONS OF STEEL**



THE FLAME THAT KEPT A MILL "ALIVE"

One of three emergency oxy-acetylene flame cutters specially constructed to keep this rolling mill in operation, despite a broken bloom shear.

In a major steel plant, the bloom shear in a rolling mill was badly damaged. Repair time was estimated at six weeks. Meanwhile, the mill would be shut down.

The mill management called LINDE SERVICE for assistance in applying oxy-acetylene flame cutting as a replacement for the shear. Three emergency hot-cutting machines were constructed to LINDE design and specifications. Result? The mill was back in production within three days.

This "temporary" operation was in service three and a half months. During that time many thousands of tons of steel were rolled by a mill that would have been shut down if it weren't for oxygen . . . and an assist by LINDE SERVICE.

If you use oxygen in your operations, LINDE SERVICE can mean dollar savings to you. Let us tell you more about it.

LINDE AIR PRODUCTS COMPANY

A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street  New York 17, N. Y.

Offices in Principal Cities

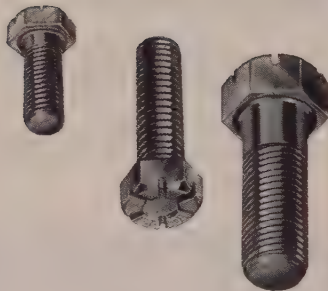
In Canada: Dominion Oxygen Company, Limited, Toronto

* LINDE SERVICE

is the unique combination of research, engineering, and more than 40 years of accumulated know-how that is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.



cold forged precision cap-screws



CHANDLER fasteners are manufactured to the highest standards of precision, uniformity and economy of assembly. **CHANDLER** specializes in one thing only . . . cold forged metal fasteners of the finest alloy steel, made to exacting specifications.

CHANDLER is prepared to render highly specialized or standard fasteners to your complete satisfaction. To make assembly faster, every fastener must pass rigid inspection, insuring uniformity, accuracy and good appearance.

CHANDLER supplies every industry with the very finest cold forged precision cap screws. Automotive, aviation, transportation, farm implement . . . whatever your needs — **SPECIFY CHANDLER.**

Write today for catalog →



1308-CH



Specialists in Thread-Rolling after Heat-Treating



CHANDLER
PRODUCTS
CORPORATION

1488 CHARDON ROAD • CLEVELAND 17, OHIO

NEW PRODUCTS and equipment

Tank measures 13 x 24 $\frac{3}{4}$ x 8 $\frac{3}{4}$ inches, has working capacity of 8 gallons of solvent and is made of terne plate electrically seam welded. Hinged cover is self-closing; tank can be used only when foot is on the treadle. Protectoseal Co., Dept. ST, 1920 S. Western Ave., Chicago 8, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Hydraulic Hose Selector

. . . determines proper specs

Starting with any known factor—such as ID, OD, minimum burst, working pressure required, or bend radius—a designer or maintenance



man can use this hydraulic hose selector to determine proper rubber-covered hose for a specific operation. The selector is offered without charge. Republic Rubber Division, Lee Rubber & Tire Corp., Dept. ST, Youngstown 1, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Variable-Speed Transmissions

. . . more power, same size

Model 28 infinitely variable speed drive increases power about 50 per cent over the manufacturer's previous models, but is approximately the same size. It em-

USE A
REPLY CARD

Just circle the corresponding number of any item in this section for more information.



INFORMATION

AVAILABLE FOR THE ASKING

Plastic Gasketing

S. Stoneware Co.—Tygon corn-resistant gasketing, composed of modified polyvinyl resins, is subject of illustrated bulletin G-520. Material is available in sheet, tubing, cord, diaphragms, die-cut, cut molded gasketing. Physical properties are fully discussed and formulae tabulated.

Snagging & Grinding Wheels

Cleveland Quarries Co., Sterling Grinding Wheel Div.—Resinoid bond snagging and grinding wheels are described in illustrated bulletin. Types shown are for both stationary and portable grinder applications. Tabular wheel recommendations are included for different metals and materials.

Pallet-less Handling

Wheeler & Towne Mfg. Co.—Special plate and fork truck equipped with a pusher attachment comprises Pak-Loader system for handling materials in unit loads without use of pallets. System is detailed in illustrated bulletin P-1173-A. Actual operation is shown.

Clamp Assemblies

Clampco Inc.—58-page spiral bound catalog offers information on line of clamp assemblies and fixture details. Components necessary to standardize engineering practice are presented, along with full scale layouts. Cross sectional diagrams and specifications are given.

Reclaiming Castings

Metallizing Co. of America—Advantages of the Dot Weld low temperature welding process for the reclaiming of castings are given in detail in 8-page booklet. Information on equipment and cost, plus case histories are presented.

Machine Tool Drives

Western Manufacturing Co.—For universalizing cone driven standard or special machines, machine tool drives

are described on illustrated data sheet. Various models accommodate motors between 1 and 15 hp. with multiple speeds and right or left hand output. Transmissions for plate or platform mounting are also briefly noted.

74. Locomotive Cranes

Orton Crane & Shovel Co.—Construction features of the Orton torque control locomotive cranes are outlined in 16-page illustrated catalog No. 84. One outstanding feature is torque control unit. Dimensions, capacities and other data are included.



75. Twine Sealing Machine

United States Steel Corp., Gerrard Steel Strapping Div.—Photos in 4-page folder show typical applications of both the 10-in. model 0400 and 14-in. model 0401 automatic twine sealing machines. Package capacities are, respectively, 10 x 7 in. and 14 x 9 in., unlimited length.

76. Metal Hose

Universal Metal Hose Co.—20-page illustrated technical data book U-111 affords information on application and temperature ranges of various types of metal and wire braided hose, couplings and assemblies. Seamless flexible metal, annularly corrugated flexible metal, interlocked flexible metal and synthetic flexible hose types are covered.

77. Grease Research

National Lead Co., Baroid Sales Div.—Bentone greases are studied in Research & Development Laboratories Technical Release No. G-1a-52. Various experiments show the effect of oil bases on oxidation characteristics, milling and working properties of greases in various oils, and effect of dispersion additives.

9-21-53

STEEL

Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

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CITY AND STATE

This card MUST be completely filled out. Please TYPE or PRINT

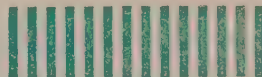
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3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
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FIRST CLASS

Permit No. 36

(Sec. 349 P.L.&R.)

CLEVELAND, OHIO



BUSINESS REPLY CARD

First Postage Stamp Necessary if Mailed in the United States

— POSTAGE WILL BE PAID BY —

STEEL

Penton Building
Cleveland 13, Ohio

ment and original design. Inserts are either of phosphor-bronze or stainless steel, and are now available in Classes 2, 2B, 3 and 3B fits. Much design information is given.

85. Press Fabrication

Clearing Machine Corp.—In 24-pages, well-illustrated brochure "The Hall of Giants" shows how large Clearing presses are made. Pictures show planning, layout, machining and assembly, and then disassembly and shipping. Last double page illustrates typical presses from the wide company line.

86. Industrial Steam Trap

W. H. Nicholson & Co.—Type D thermostatic bellows steam trap is featured in bulletin No. 351. Constructed of bronze, trap is made in ¼, ⅜, ½ and ¾-in. angle type for pressures from vacuum to 200 psi.



EDITORIAL ARTICLES

Available in Limited Quantities

87. Truck Safety Program

W. A. Meddick, Vice President of Elwell-Parker Electric Co., tells how to "Stop Truck Accidents Before They Occur" in STEEL article of this title. Sharp training and a tough operating code are emphasized, and tips on what to stress and where to enforce rules, are given.

88. Induction Forging

"Induction Forging Can Be Versatile," according to STEEL article by F. T. Chesnut, Ajax Electrothermic Corp. Wide variety of parts coming off presses at Massey-Harris focuses new light on these production heaters. Big library of fixtures is key to speedy changeovers.

89. Aluminum Weathering Tests

Outdoor weathering tests made on wrought and cast aluminum and Al-clad structural surfaces show thin protective oxide film is formed after initial penetration. Attack then tends to go laterally along surface. C. J. Walton, C. O. Sprowls and J. A. Nock, Jr. of Aluminum Research Laboratories present test results in STEEL article "Aluminum 'Self-Stops' Corrosion."

90. Quick Steel Analysis

Quantometer installations at two Crucible Steel works give melters better control over characteristics of various heats. Test results come back in matter of minutes. The story is in STEEL reprint "Quick Analysis Leads to Better Steel."

78. High Temperature Pipe

United States Steel Corp., National Tube Div.—Technical data on pipe and tubes for elevated temperature service are found in 66-page wire-bound bulletin No. 26. Much information is in table and graph form for a long list of steels.

79. Hydraulic Pumps, Controls

Vickers Inc.—Pumps; pressure, volume and directional controls; control assemblies; hydraulic motors; transmissions; cylinders; and hydraulic accessories are effectively described and specified in 56-page illustrated catalog 5001. Items designated JIC encompass Joint Industry Conference standards directed toward ease of maintenance, safety, long life and uninterrupted production.

80. Shock Insulation

Fabreeka Products Co.—General properties of Fabreeka, a resilient material for reducing shock, vibration and noise, are outlined in 36-page illustrated booklet. Wide variety of machinery and transportation applications are described, and many technical data given.

81. High Vacuum Pumps

F. J. Stokes Machine Co.—"Microvac Pumps For High Vacuum" is title of well-illustrated 36-page brochure No. 750. In addition to giving specs and showing installations of many different units, brochure has valuable tables of constants, formulas, and conversions used in vacuum processing. Applications illustrated include metallization and impregnation of various products, and extrusion of clay products.

82. Pneumatic Products

C. A. Norgren Co.—A file type catalog, 60-page form No. A-500 contains a wealth of illustrated data on filters, valves, regulators, hosing and other similar products for pneumatic service. Each item is given full page treatment, separately illustrated and described.

83. Metal Disintegration

Clinton Machine Co., Metalmaster Div.—In operations manual on the model 952 metal disintegrator are given a series of general operating instructions and hints for this machine. Manual helps operator become efficient at the various machine functions, which include arc and cold welding, and removal of taps, drills and other broken tools.

84. Thread Inserts

Heli-Coil Corp.—22-page bulletin No. 652 indicates the applications of wire thread inserts both in replace-

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STEEL

Penton Building

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FIRST CLASS
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9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL

Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

NAME TITLE

COMPANY

PRODUCTS MANUFACTURED

ADDRESS

CITY AND STATE

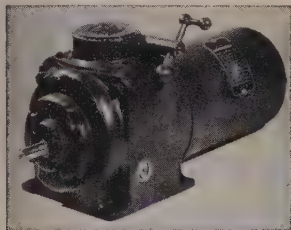
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9-21-53

EW PRODUCTS and equipment

...has a two-piece housing with integral base, improved control that provides linearity.

Model delivers all speeds from any desired maximum to zero. Speed can be changed with the



transmission running or stationary. Drive incorporates built-in overload protection that protects both itself and the driven machine in event of excessive overload. Gram Transmissions Inc., Dept. ST, Menomonee Falls, Wis.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Revolving Crane Truck

... boom travel: 180 degrees

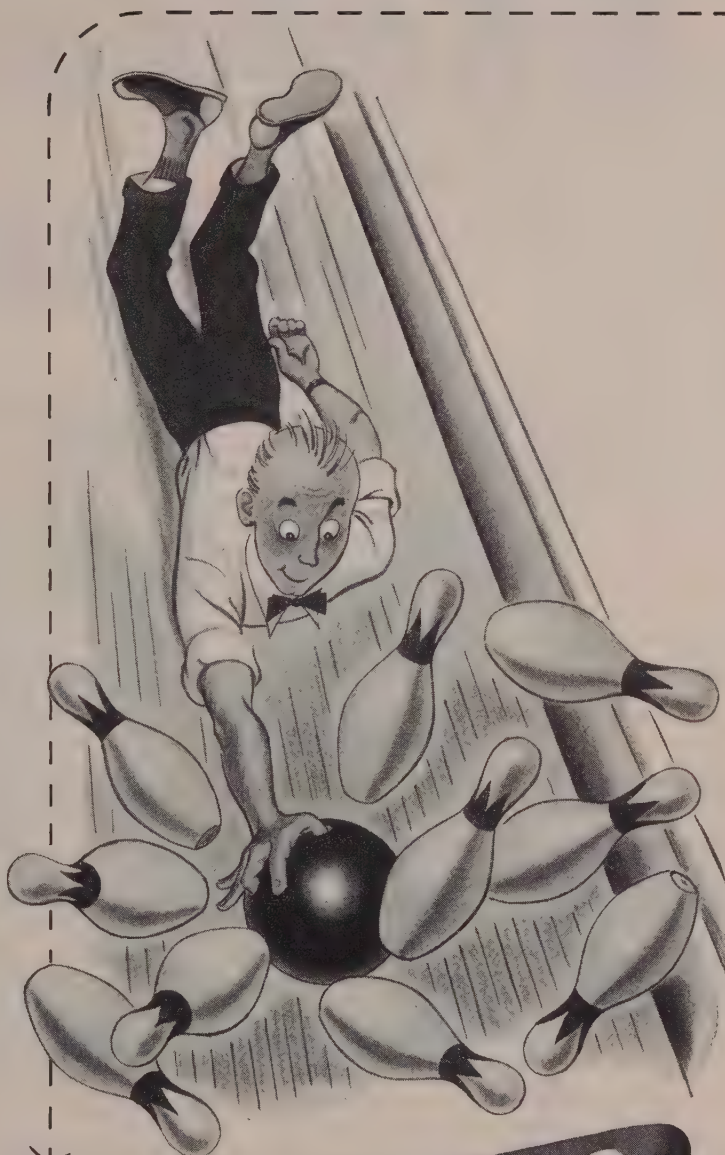
This truck model has applications in handling molds and other equipment in storage for miscellaneous work. It has capacity of



2000 pounds and over-all 68-inch height. Its hook, 60 inches high when raised and 10 inches when lowered, projects 24 inches over either side of the truck and is raised and lowered by power.

Power operation is furnished by a separate pump and motor that

for a fabulous finish...



JEWEL BRAND Abrasive Belts

for grinding, sanding, polishing —
metal, wood, leather, plastics, rubber.



USE A
REPLY CARD

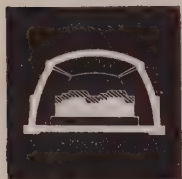
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ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85, Massachusetts

NEW general-purpose shell gives greater latitude

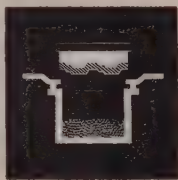
Bakelite Company announces the development of a new general-purpose shell molding resin that *can be subjected to a greater variation in operating conditions than ordinary shell molding resins.*



Shell molds bonded with this resin reach minimum usable strength in the curing operation faster than molds made with ordinary resins.

They also retain their strength for longer periods at curing temperatures, permitting greater leeway in curing time.

This new BAKELITE phenolic resin reduces the tendency of the resin-sand mixture to fall off the pattern plate during the inverting operation.



Shell molds made with this new resin resist the tendency to distort upon ejection from the hot pattern plate, insuring better mating of mold halves. This hot rigidity is obtained without sacrificing toughness

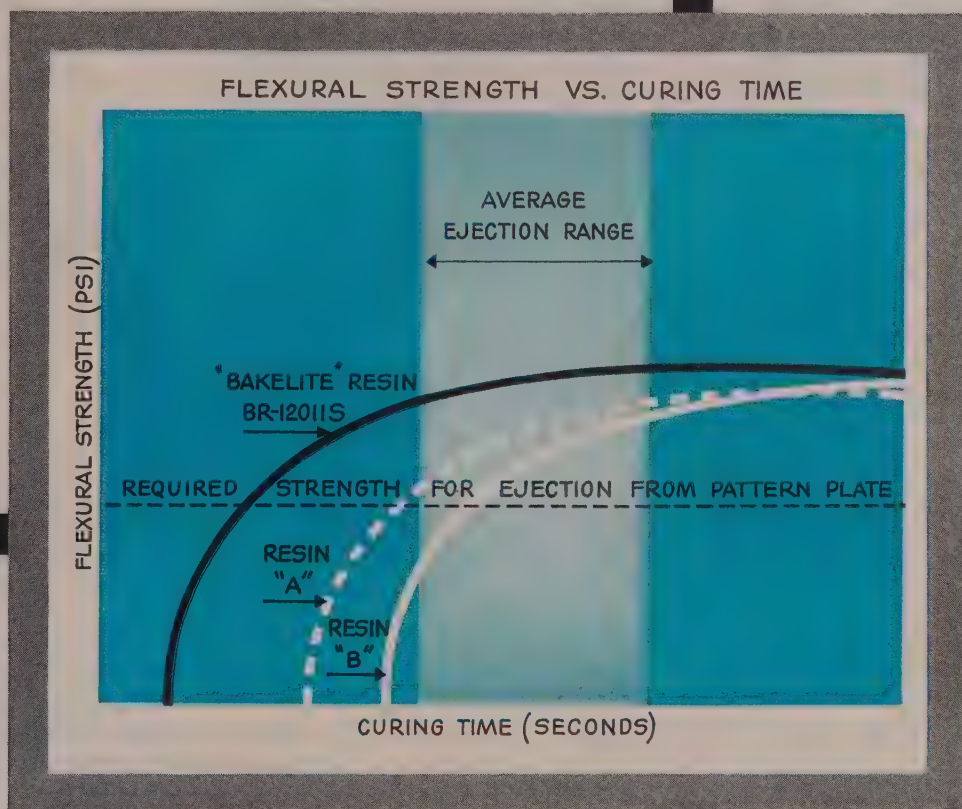


and provides molds that are more dimensionally stable, and which resist deformation during the pouring operation.

Field and laboratory tests of molds made with BAKELITE phenolic resins reveal a direct correlation between resin particle size and mold strength. In common with other BAKELITE phenolic shell molding resins, the new resin is finely ground, and is uniform both as to particle size and batch-to-batch production. The fine uniform particles give greater coverage per pound of resin. Smaller quantities of resin are needed to reach minimum usable strength, with resulting economies. This uniformity also eliminates the need for foundrymen to make extensive adjustments in formulation during production operations.

Shell molding produces castings with close tolerances, almost pattern-smooth, that reduce machining and finishing operations, speeding production and cutting costs. While your plans are still in the design stage, ask your foundryman how this new process can improve your operations. Also, write Dept. QI-49, for further information on BAKELITE Phenolic resins developed expressly for shell molding.

molding resin in mold-making



BAKELITE Resin BR-12011S is resistant to distortion upon ejection from the hot pattern plate because of its high flexural strength when hot. Shell molds produced with this material will reach a minimum usable strength faster than ordinary shell molding resins, and will retain a strength in excess of this minimum for longer periods while still at curing temperatures.

BAKELITE

TRADE-MARK

**RESINS FOR
SHELL MOLDING**



TRADE MARK

BAKELITE COMPANY

A Division of
Union Carbide and Carbon Corporation

UCC

30 East 42nd Street, New York 17, N. Y.

In Canada:

Bakelite Company (Canada) Ltd., Belleville, Ont.



**FIXTURE
AUTOMATICALLY TILTS,
CLAMPS PARTS for
GENERATING TYPE
BROACHING**

*Speeds production of
parking brake brackets
designed and built
the **American** way*



Two parallel surfaces on each of two parts are straddle broached in one pass on this American SB-42-10 single ram broaching machine. Over 350 of these intricate parking brake brackets are completed every hour.

The complete tooling designed the American Way features:

1. Generating type broaches.
2. Fully automatic work holding fixture with tilting table.
3. Automatic clamping and unclamping of parts.

The operator simply loads and unloads the parts, starting each machine cycle by push button control.

For the answer to your broaching problem send a part-print or sample and hourly requirements to American . . . the organization that gives you the extra advantages of experience in producing all three . . . broaches, machines and fixtures. No obligation. Address Dept. S.

For more information on the American SB-42-10 and other American machines, write for Circular #300.



American BROACH & MACHINE CO.

A DIVISION OF SUNSTRAND MACHINE TOOL CO.

American Building - Ann Arbor, Michigan



pumps fluid into a double-acting ram inside the main mast. A double-acting ram is also used so the hook, whether loaded or empty, will lower at a safe speed without depending upon gravity. Boom has complete angular travel of more than 180 degrees. Market Forge Co., Dept. ST, Everett, Mass.
FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Powered Wheelbarrow

. . . uses platforms or bucket

Electric starting ¾-ton capacity model is an addition to the manufacturer's line of powered wheelbarrows. Only 32-inches wide, it moves easily through standard



doorways and maneuvers in confined areas.

Two flatbed platform sizes are interchangeable with the 10-cu-ft bucket for moving heavy maintenance items as well as hauling scrap and refuse. Prime-Mover Co., Dept. ST, Muscatine, Iowa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

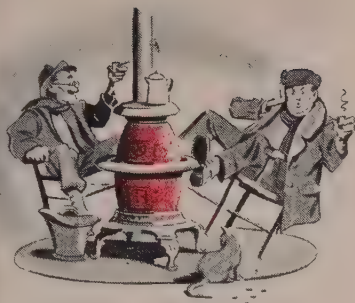
Electronic Controllers

. . . indicate temperature, flow

Line of Free-Vane electronic controllers is available as indicating or recording controllers for



temperature, pressure, flow, liquid level, humidity and time program-



THE BURLINGTON LIARS' CLUB

SPINS A YARN FOR **BAKER'S MAGDOLITE**



FINDERS KEEPERS

After going to bed one night, a G.I. stationed in Japan, heard the barracks door open. Assuming the noise was made by some of his buddies returning, he paid no attention to it. Suddenly, two large shadows fell across his cot and he looked up. Standing beside him were two mosquitoes well over six feet tall!

Too frightened to move, the G.I. lay there petrified while the mosquitoes spoke: "Shall we eat him here or take him home?" said one. "Don't be silly", replied the other. "You know very well if we carry him home the big mosquitoes will take him away from us!"

"Finders Keepers", the title of this story, reminds us of our customers. Once they *find* out how good BAKER'S MAGDOLITE is, they *keep* ordering it again and again.

Why don't you join the long list of satisfied customers who have learned to rely on BAKER'S MAGDOLITE—the original dead-burned dolomite? Try it... find how its superior chemical, physical, and mineralogical composition assures ingot uniformity and reduces maintenance costs. We know you'll keep specifying BAKER'S MAGDOLITE, the dolomite which continued research has made 5 ways better: Composition, Preparation, Economy, Strength, Quality.



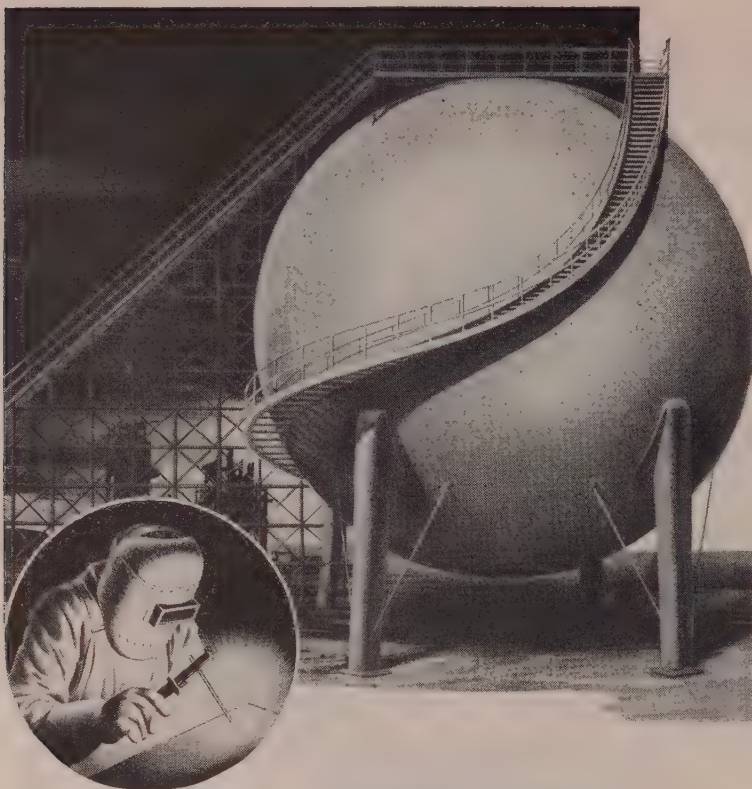
PRODUCTS
SINCE 1889

MAKERS OF BAKER'S
MAGDOLITE

© The J. E. Baker Company

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA

Plants: York, Billmeyer, Pennsylvania — Millersville, Ohio



For easier, faster welding use one electrode for all positions

Gas or liquid retaining hortonspheres are welded in the field. In the process, every welding position is used—downhand, vertical and overhead. Today, because one electrode can produce sound weld metal from every position, considerable time is saved by eliminating frequent electrode changes.

You can profit from this same advantage by using Arcos Low Hydrogen Electrodes for welding high tensile steels. With few exceptions, once you select the proper electrode, you can keep on welding with *one electrode*—no need to change electrodes for different welding positions. Besides saving time, inventory can be simplified.

ARCOS GRADE	A. W. S. SPEC.
Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9015
Manganend 2M	E10015
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015

Arcos quality controls, highest in the industry, assure you dependable, uniform weld metal for every application. Write for "The ABC's of Welding High Tensile Steels".

ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Penna.

WELD WITH ARCOS

LOW HYDROGEN ELECTRODES



NEW PRODUCTS and equipment

ming. They use the company's standard measuring elements.

Based on a principle of frequency modulation, controllers are offered for low-open, high-open, low-high, low-open-high or low-normal-high control, as well as proportional input control. Various combinations of one or two recording pens or indicators with one or two control units in one case make the units adaptable to a wide range of control problems. Bristol Co., Dept. ST, Waterbury 20, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Spherical Bearings

... with ball race adjustment



Spherical bearings and spherical rod end bearings, called Adjusta-Ball, have means for adjusting ball race to provide thoroughly accurate positioning of the bearing. This not only gains maximum correction of misalignment, but increases service life since proper adjustment can always be made to compensate for wear.

Each bearing race insert is so designed that it can be adjusted to any desired degree of relationship to the ball. By use of a spanner wrench inserted in the notches on the outer edge, race can be tightened or loosened, with one notch adjustment slightly less than 0.001-inch. All bearings are prelubricated. Lincoln Park Industries Inc., Dept. ST, 1719 Ferris Ave., Lincoln Park 25, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Universal Pallet Dolly

... rolls without casters



This dolly rolls and steers over any type floor without any swivel casters. Its maneuverability, operating ease and ability to roll on rough or slatted floors are advantages of improved design.

Twenty-four 6-inch wheels support the load and provide surface contact over rough surfaces. Wheels are available with rubber tread or aluminum alloy tread to

NEW PRODUCTS and equipment

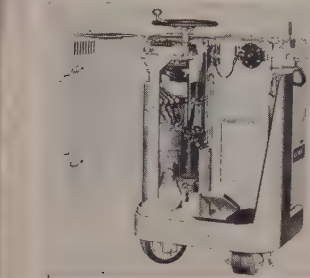
it varying operating conditions. Front and rear wheels are mounted on spring-loaded axles. Standard sizes are 30 x 40 and 40 x 48 inches. Roll Rite Corp., Dept. ST, 801 Jefferson St., Oakland, Calif.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Improved Truck Power Unit

... no servicing underneath

This improved truck power unit opens like a book to ease servicing and maintenance on the manufacturer's entire line of electric



industrial trucks. All moving parts are housed behind hinged double doors. There is nothing to inspect or service under the unit, except wheels. One example: the complete turret drive assembly can be exchanged in 30 minutes.

All brushes are visible for fast inspection and replacement. Control switches, contactors and lubrication points are likewise located for fast servicing. Addition of a foot extension supplies extra operator space; leg guards are sponge rubber padded for comfort. Travel switch provides three separate speeds in both forward and reverse. Raymond Corp., Dept. ST, Greene, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Conveyor Roll Ball Bearing

... operates on 1/3 less grade



Low-friction ball bearing, called X-series, is developed specifically for conveyor rolls. In these units, balls are separated with a one-piece retainer that requires no rivets to hold parts together. It is interchangeable with the old-type bearing and has same capacity.

With less friction, it is reported



When high operating pressures call for strong welds . . .

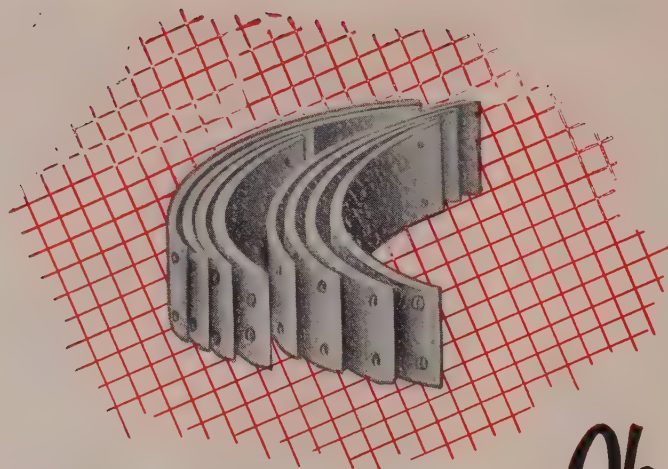
Arcos stainless electrodes can deliver top-performing weld metal for high-pressure jobs—as well as others—because the specific qualities needed are "built in" every electrode. Arcos makes many electrodes for all kinds of jobs—each requiring a different balance of physical, chemical, or metallurgical properties. But, no matter how varied the requirements, Arcos electrodes will meet every one—consistently—yielding in the flash of an arc the highest grade weld metal available today.

For more information about specific applications of Arcos quality-controlled stainless electrodes, send for booklet, "What Electrode Would You Use?"

ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pennsylvania



WELD WITH
ARCOS
STAINLESS ELECTRODES




BETTER WIRE—BETTER BRAKE LINING?

Oh, YES!

for Automobiles  ... Trucks ... Motorcycles

Farm Implements ... Hoists ... Tractors



Earth Moving  and other Industrial Machinery

WIRE REYNOLDS protects performance

Who makes the brake lining? The answer is important to automotive, agricultural and other industrial users.

But who makes the wire cloth that reinforces the brake lining?

That, too, is important. To the makers of the brake lining. To those who build brake lining into their motor cars, trucks, buses, farm implements, contractors' and other kinds of machinery. And to the users of those machines.

Because the better the wire, the more

dependable and the more uniformly effective the braking. And it prolongs the wear and adds to the service life of the lining.

There is no better reinforcing agent than Reynolds Wire Cloth—for all compounds, plastics, rubbers, and building materials.

For the automotive and all other "precise specification" industries, Reynolds is made to meet special requirements—by engineers with 50 years' specialized know-how, using the most modern equipment and methods. Consultation without obligation.

REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO.
DIXON, ILLINOIS

Divisions of National-Standard Co.

ATHENIA STEEL...Clifton, N. J.	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...Niles, Mich.	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...Jersey City, N. J.	Metal Decorating Equipment
WORCESTER WIRE WORKS...Worcester, Mass.	Round and Shaped Steel Wire, Small Sizes



NEW PRODUCTS and equipment

o operate by gravity on one-third
ess grade than the manufacturer's
previous types. Logan Co., Dept.
ST, Louisville, Ky.

FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Air Cylinder Line

... built-in operating valve

Built-in operating valve is fea-
tured in this line of air cylinders.
This type of cylinder eliminates
one pipe connection usually re-
quired for a double-acting cylinder
and is reported to increase effi-
ciency by reducing line friction.

Integral valve is a universal



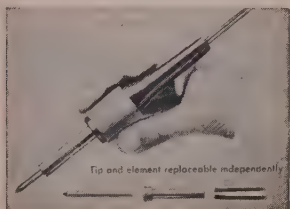
type, furnished so it can be oper-
ated by miniature poppets, direct
or remote, or converted to single
or double solenoid operation. Valve
can be furnished with dual speed
controls. A full line of two-way
poppet valves for air-limit, hand
or foot operation will be offered in
addition to standard electrical con-
version units. Carter Controls,
Dept. ST, 2928 Bernice Rd., Lan-
sing, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Pencil Soldering Iron

... tip, element are separate

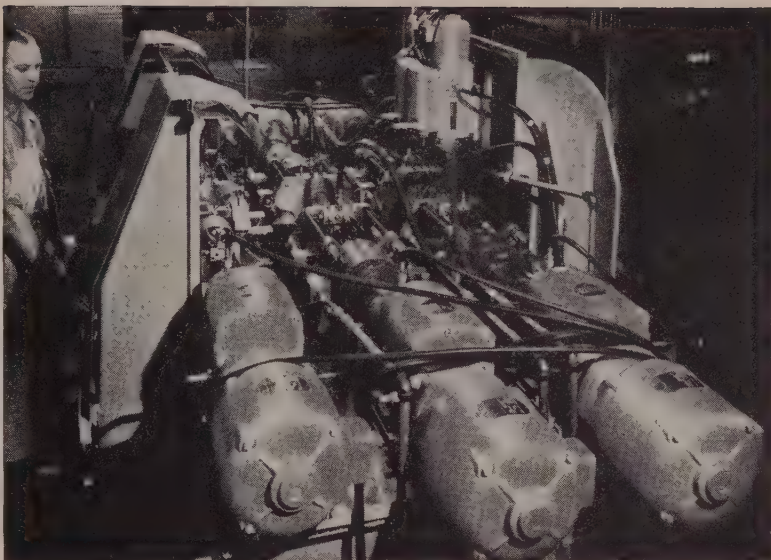
This soldering iron combines ad-
vantages of a pencil iron and in-
dustrial soldering iron. It is built
with nickel-chromium and mica
wound mounted elements. Tip and



element are separate parts, both
replaceable independently.

The unit is available in 25 w
with 1/8-inch tip or 30 w with 3/16-
inch tip. Hexacon Electric Co.,
Dept. ST, 139 W. Clay Ave., Roselle
Park, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22



Machine Details

Dimensions: 10 3/4' long, 6 1/2' wide, 7' high; weight about
16,000 lbs. 8 Delta drill units: 6 Model 19-400; 2 Model
19-150. 5 drill units equipped with multiple-spindle drill
heads. Total HP—13.



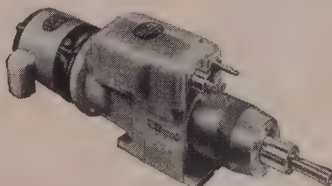
Control Panel

Selector switches make possible any combination of 3
positions, 8 stations—a universal machine. Operator
presses a starting button; sequence of operations is auto-
matic; machine stops automatically when work is finished.
3000 feet of wiring between panel and machine.

When conventional tools required 25
minutes to complete 9 holes in a spirit-
duplicator cylinder, A. B. Dick engi-
neers built their own special horizontal
drilling machine, using 8 Delta air
powered hydraulic drill units, and now
do the job in less than two minutes.

Their new machine drills, spot faces
and reams 9 holes in aluminum cylin-
ders—needs but a single operator, has
automatic remote control.

Operation of this 3-position, 8-sta-
tion machine consists of loading and
pressing the starting button. The Delta
drill units operate in four banks, in
automatically controlled sequence of
drilling, spot facing, milling and ream-
ing. When the cycle is completed, the
finished piece returns to original posi-
tion and the machine stops. It is uni-



DELTA QUALITY
MAKES THE DIFFERENCE

From 25 minutes
to 2 minutes
—that's the time saved
by A.B. DICK CO.
with 8 DELTA
AIR-POWERED
HYDRAULIC DRILL UNITS

versal—handles any piece up to 12"
diameter and 24" length.

"This machine is so fast and so accu-
rate," says Edward Brenn, design en-
gineer, "that 3 or 4 days use per month
is ample to keep up with production
demand. The operator is free for other
duties. We just didn't have the equip-
ment to do this job economically—so we
built the machine ourselves."

Three Delta air powered hydraulic
drill unit models are now available to
meet your specific requirements—1 1/2",
4" or 6" stroke; No. 80 to 1" diameter
drill. See your authorized Delta drill
unit dealer—write for new catalog.

DELTA QUALITY MACHINE TOOLS
Another Product of **Rockwell**



Delta Drill Unit Division
Rockwell Manufacturing Company
638J N. Lexington Avenue,
Pittsburgh 8, Pa.

☐ Please send catalog AD-723.

☐ Send name of nearest authorized Delta drill
unit dealer.

Name _____
Position _____
Company _____
Address _____
City _____ Zone _____ State _____

Aluminum is *Why* you can do what you doodle

In an extruded shape, you can put the metal exactly where you want it.

Almost any cross-section you sketch can be duplicated in metal. Extrusion eliminates design compromises that are required when a part must be built up by riveting or welding, or machined out of solid metal... and saves production time.

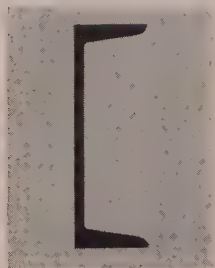
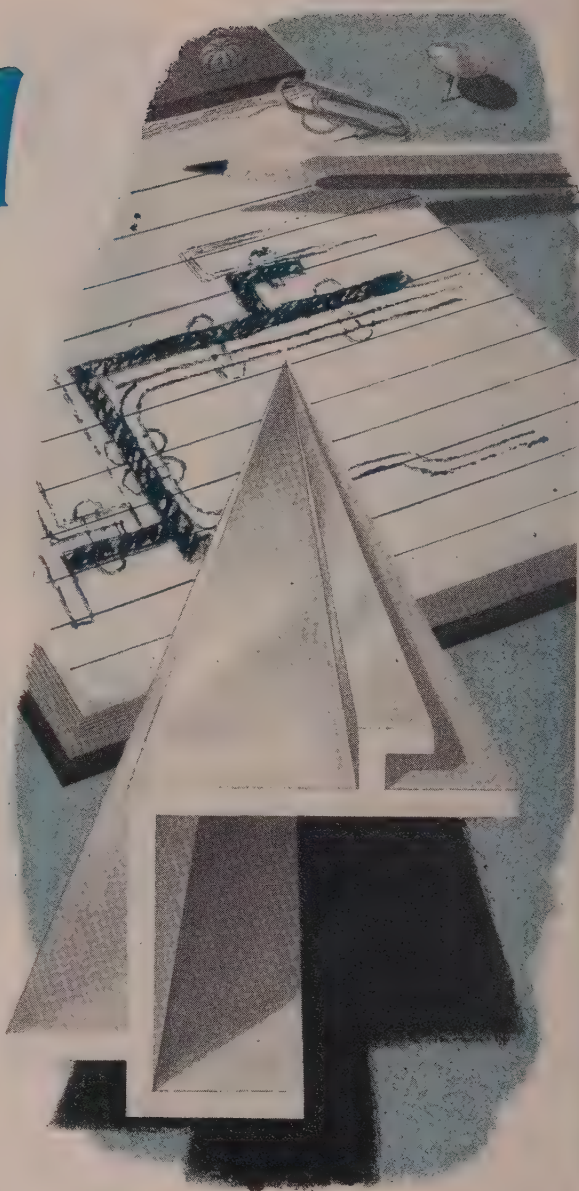
While extrusion is not a precision process, extruded shapes can be produced to fairly close tolerances. Lengths up to 80 feet or more are possible. Alcoa has a wide selection of standard extrusion alloys, from versatile 63S (excellent for architecture) to high-strength 75S (much used in aircraft).

ALCOA is *How*

Alcoa is the world's largest light metal extrusion facility—operating plants in Lafayette, Ind.; New Kensington, Pa.; Cressona, Pa.; Vernon, Calif., and soon in Vancouver, Wash. Knowledge gained from 50 years in the extrusion business is available to help you use these efficient shapes. The output of 50 extrusion presses is available. Aluminum Company of America, 877-J Alcoa Building, Pittsburgh 19, Pa.

Alcoa  **Aluminum**

ALUMINUM COMPANY OF AMERICA

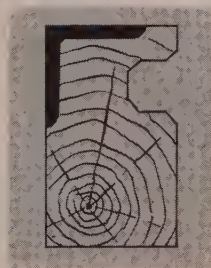


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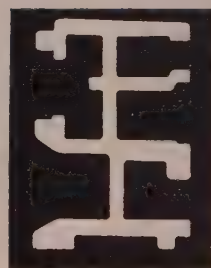


B

EXTRUDED CHANNEL B is designed to distribute the metal where it will resist column loads more effectively than Standard Channel A. As a result, it will support as a long column almost twice as much load as Channel A, though their weight is the same (2.91 pounds per foot).



C

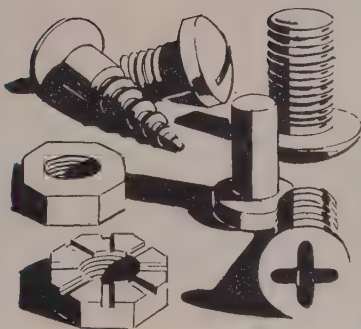


D

FIGURE C is a cross-section of a steel-reinforced wood beam used in a loom. It was desired that it be replaced with lightweight aluminum. Extrusion D offered the only method short of prohibitively expensive machining and required only surface finishing.



CORROSION-RESISTANT bearings of Alcoa® Aluminum lower diesel engine maintenance. They are solid metal all through.

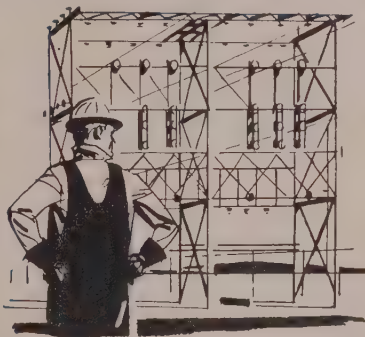


***FASTENERS** of aluminum are made by Alcoa in every commercial size and shape. A must with aluminum assemblies, they also dress up wood and plastic products.

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are available from
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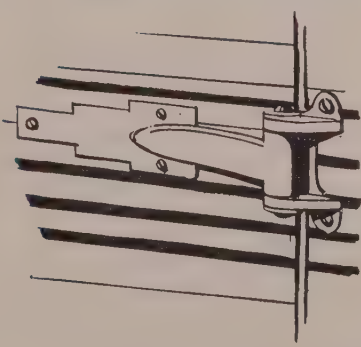
ALCOA ALUMINUM takes all finishes that other metals will take—plus gleaming, rust-resistant anodic coatings which are best on aluminum.



***ROLLED SHAPES** available in Alcoa Aluminum include equal angles, unequal angles, channels, I-beams, H-beams, tees and zeeks.



***RIGID CONDUIT** of Alcoa Aluminum is the lowest cost corrosion-resistant metallic conduit available. Its nonmagnetic properties improve electrical efficiency—its light weight speeds installation.



ALCOA ALUMINUM FORGINGS meet the need in products that must be light in weight, high in strength. Alcoa forge shops are ready with expanded facilities and new production methods.

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Copper plating line showing electrocleaning, spray rinse, cyanide dip, copper strike and copper plating tank. This line at Daystrom measures 142.5 feet long



After copper plating and rinse, furniture parts are given 50 millionths inch nickel coat. Follows another rinse and then a 30 millionths inch chromium finish

How One Plater Beat Nickel Shortage

After switching to copper during emergency, prominent company now says it probably won't go back to full nickel plating even after the governmental curbs are lifted

NICKEL plate was a widely used protective base for chrome-finished tubular furniture before the Korean war. Restrictions sent the industry scurrying for substitutes, and, as a stopgap measure, Daystrom Furniture, division of Daystrom Corp., Olean, N. Y., turned to copper. Today, the company's completely sold on the emergency metal.

"It's doubtful whether we'll go back to full nickel-plating," says M. E. Kilroy, head of quality control at Daystrom. "When the freeze eases, we'll probably put a nickel coating — maybe up to 0.0003-inch—on top of copper."

Company uses Wes-X PR bright copper plating process of the Hanson-Van Winkle-Munning Co., Matawan, N. J., which can turn out 100,000 lineal feet of tubing each day.

Balance Sheet — Daystrom has used PR processing on a continuous, 24-hour basis since the summer of 1951. Present coatings are: Copper, 0.00075 inch; chrome, 30 millionths inch; and nickel, 50 millionths inch, which is the maximum allowed.

Company says copper gives as good or better corrosion resist-

ance as nickel. Over-all chemical costs are about the same. Copper is cheaper than nickel, but price of copper salts makes up the difference.

However, labor expenses were cut in half. In the nickel-chrome operation, two plating machines and a crew of eight men were required. Now, four men operate the 40,000-gallon, Hanson-designed machine, which is the second largest in the world.

Give and Take—Wes-X process operates on a periodic, reverse-current principle. It alternately plates and deplates a piece of work, to give it a smooth, shiny finish. Period current reversal shaves down microscopic hills and fills in valleys of copper. This leveling increases copper's resistance to corrosion.

Process, which operates under high current densities, deposits heavy coatings of copper in a short period. In making irregularly-shaped pieces of furniture, these high densities are needed. Some pieces have target distances to metal anodes that vary as much as 18 inches.

Changeover—Before curbs were legislated, Daystrom did nickel

plating in one machine and chromium plating in a second. First thing engineers did was to combine copper and chromium operations in one machine.

Mechanical changes included installing more elevator stations and putting in steel heat exchangers.

Plating Circuit — Electroplating operation takes place on a 285-foot, racetrack-shaped plating line. Phases include: Loading racks with work to be plated; cleaning work prior to plating; plating with copper on homestretch; plating with nickel; plating with chromium; unloading finished parts; and, finally, cleaning and stripping racks on backstretch.

Except for loading and unloading, operation is automatic. Conveyor system carries work from station to station, a distance of 42 inches. Elevators dunk work into baths, which are 6 feet, 10 inches wide at each station.

Along the Line—Work passes through 8 stations before reaching the copper strike tank. Preceding stops include two electrocleaning tanks, spray tank, three rinse and spray tanks, acid dip tank and a cyanide dip tank.

Alkaline cleaner from the second electrocleaning tank (station No. 3) is pumped into the first electrocleaning tank (station No. 1) at end of each week. Solution from No. 1 is discarded each week.

In the cyanide dip tank, about 40 ounces of sodium cyanide per gallon of water is used. Bath neutralizes acid still clinging to parts, removes all traces of ferric salts and acts as an intermediate between water tank and copper strike tank.

Copper strike tank prepares parts for Wes-X dip and is necessary for good adhesion of copper to steel. Bath is about 80 per cent efficient.

Wes-X Bath—Process takes 23 station stops. Racks and work at first three and last two are cathodic. Others are alternately anodic and cathodic. Plating takes place at 100 amps per sq ft. Time is 13 minutes, 44 seconds at 180 to 190°F at pH of about 12. Latter controls amount of materials added to bath.

Constituents of bath in ounces per gallon are: Copper, 8.0; free potassium cyanide, 1.5; potassium hydroxide, 6.5-7; and potassium carbonate, 8.0.

Copper solution is filtered continuously. At Daystrom, two 7500 gph filters turn over solution in tank every hour. Bath air is agitated by 160-cfm, low-pressure blower operating at 5 psi.

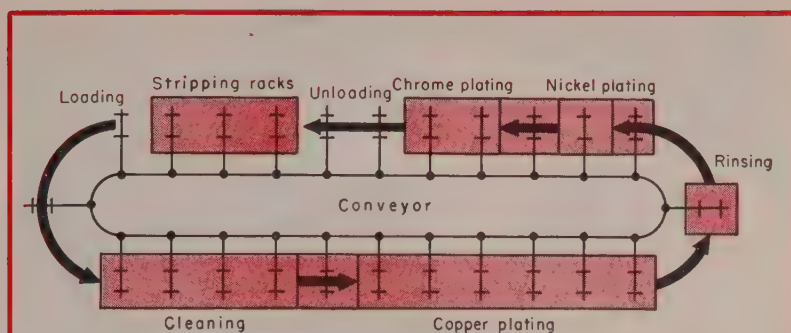
Windup—Before the 42-second nickel strike (station No. 15) and chromium plating (station No. 17), work goes through a save-rinse tank, which is air agitated. Water is deionized in a 1000-gph unit; then air is bubbled through it to drive out carbon dioxide.

Water from reclaim tank is used as make-up water for plating tank. Because make-up water amounts to about 50,000 gallons each 24 hours, dragout loss is small.

Standard chromium-plating operation is used. Time is 3 minutes, 6 seconds. After rinsing, work goes into an alkali strip tank, which removes chrome plate at exposed contact points. Concentration of caustic soda used is 4 to 6 ounces per gallon in a cold solution.

If chromium is not taken off at this point, it would later contaminate cleaning baths and plating solutions. After a cold rinse, muriatic acid dip is used to neutralize alkali. Last two stops on line are hot rinse and loading station.

Power—Six generators supply



Stations Involved in Copper Plating Process

Station:	Conditions:
1. Electrocleaning tank	Alkaline cleaner; temperature, 180° F, dip time, 42 sec.
2. Spray tank	Room temperature, plain water, time 6 sec.
3. Electrocleaning tank	Same as No. 1
4. Rinse and spray tank	Time, 6 sec.
5. Rinse and spray tank	Time, 6 sec.
6. Acid dip tank	Sulphuric acid, time, 6 sec.
7. Rinse and spray	Time, 6 sec.
8. Cyanide dip tank	Concentration: About 10 oz/gal sodium cyanide
9. Copper strike tank	Temperature, 140 to 160° F, time, 42 sec.
10. Wes-X bath	Temperature, 180 to 190° F, pH about 12, time, 13 min., 44 sec.
11. Save rinse tank	Time, 6 sec.
12. Cold rinse	Time, 6 sec.
13. Acid dip tank	Time, 6 sec.
14. Cold rinse	Time, 6 sec.
15. Nickel strike	Time, 42 sec.
16. Cold rinse	Time, 6 sec.
17. Chromium plating tank	Standard operation, time, 3 min., 6 sec.
18. Reclaim rinse	Time, 6 sec.
19. Cold rinse	Time, 6 sec.
20. Cold rinse	Time, 6 sec.
21. Cold rinse	Time, 6 sec.
22. Hot rinse	Time, 6 sec.
23. Unload	Racks are left on carrier arms, time, 3 min., 6 sec.
24. Alkali dip tank	Cold solution of caustic soda. 4 to 6 oz/gal, time, 1 min., 54 sec.
25. Cold rinse	Time, 6 sec.
26. Muriatic acid dip	Time, 6 sec.
27. Hot rinse	Time, 6 sec.
28. Loading station	Time, 3 min., 6 sec.

current used in cleaning and plating tanks. Three 7500-amp units provide current for 18 periodic reverse stations of Wes-X bath. Each generator services six stations.

A 10,000-amp unit supplies current for nickel and chrome plating operations. Two smaller generators are used for electrolytic alkaline cleaning and electrolytic acids, as well as five stations of Wes-X bath that are cathodic.

Conveyor—Conveyor has arms extending over solution tanks. They carry two racks on which chair frames, table legs and other pieces of work are quickly loaded and unloaded. Arms are mounted on rollers set in vertical guide channels. Channels are connected to upper and lower endless chains.

Crank arms lift and lower work-carrying arms. Chain drive and elevator lift are interlocked.



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CALENDAR OF MEETINGS

September 20-23, **National Metal Trades Association:** Eastern plant management conference, Sagamore hotel, Lake George, N. Y. Association address: 122 S. Michigan Ave., Chicago 3. Commissioner: Charles L. Blatchford.

September 20-23, **Packaging Machinery Manufacturers Institute:** Annual meeting, Skytop Lodge, Skytop, Pa. Institute address: 342 Madison Ave., New York 17. Secretary-treasurer: Helen L. Stratton.

September 20-23, **American Institute of Wholesale Plumbing & Heating Supply Associations Inc.:** Annual convention, Hotel Waldorf-Astoria, New York. Institute address: 402 Albee Bldg., Washington. Executive secretary: George T. Underwood.

September 21, **Cutting Tool Manufacturers Association:** Fall meeting, Lochmoor Club, Detroit. Association address: 416 Penobscot Bldg., Detroit 26. Secretary: M. J. Ewald.

September 21-22, **Steel Founders' Society of America:** Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland. Secretary: F. Kermit Donaldson.

September 21-23, **Truck Body & Equipment Association Inc.:** Annual meeting, Sheraton-Gibson hotel, Cincinnati. Association address: 1122 DuPont Circle Bldg., Washington 6. Executive manager: Arthur J. Nuesse.

September 21-24, **American Mining Congress:** Annual metal and nonmetallic mineral mining convention, Olympic hotel, Seattle. Congress address: 1102 Ring Bldg., Washington 6. Executive vice president: Julian D. Conover.

September 21-25, **Instrument Society of America:** National instrument conference and exhibit, Hotels Morrison and Sherman, Chicago. Society address: 1319 Allegheny Ave., Pittsburgh. Manager: P. V. Jones Jr.

September 22, **Tungsten Institute:** Annual meeting, Olympic hotel, Seattle. Tungsten Institute information service: 1757 K St., NW, Washington 6. Executive secretary: James A. White.

September 23-25, **National Industrial Conference Board Inc.:** General session for all associates on marketing, Hotel Waldorf-Astoria, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

September 23-26, **National Association of Foremen:** Annual convention, Milwaukee. Association address: 321 W. 1st St., Dayton 2, O.

September 24-27, **American Refractories Institute:** Fall meeting, Broadmoor hotel, Colorado Springs, Colo. Institute address: 1872 Railway Exchange Bldg., St. Louis 1. President: W. J. Westphalen.

September 25, **Malleable Founders' Society:** General meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

September 28-30, **American Management Association:** Personnel conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

September 28-30, **National Electronics Conference Inc.:** Annual conference and exhibition, Hotel Sherman, Chicago. Conference address: 852 E. 83rd St., Chicago. Executive secretary: Karl Kramer.

September 28-October 1, **Association of Iron & Steel Engineers:** Annual meeting, Hotel William Penn, Pittsburgh. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. J. Ess.

September 29-October 3, **Society of Automotive Engineers Inc.:** National aeronautics meeting, aircraft engineering display and aircraft production forum, Hotel Statler, Los Angeles. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

September 30-October 2, **Porcelain Enamel Institute:** Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute ad-

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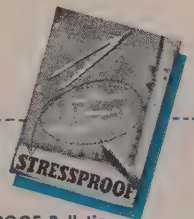
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dress: 1346 Connecticut Ave., NW, Washington 6. Secretary: John C. Oliver.

September 30-October 3. National Association of Aluminum Distributors: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Association address: 1900 Arch St., Philadelphia 3. Secretary: R. Bruce Wall.

October 1. American Iron & Steel Institute: Youngstown regional technical meeting, Hotel Pick-Ohio, Youngstown. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 5-7. American Society of Mechanical Engineers: Fall meeting, Hotel Sheraton, Rochester, N. Y. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

October 6-7. National Fluid Power Association: Fall meeting, Sheraton hotel, Chicago. Association address: 1618 Orrington Ave., Evanston, Ill. Executive secretary: Barrett Rogers.

October 6-8. American Institute of Electrical Engineers: Conference on application of motors to air-moving equipment and symposium on induction motors. Hotel Van Orman, Ft. Wayne, Ind. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

October 6-8. Electric League of Western Pennsylvania: Industrial electric exposition, William Penn hotel, Pittsburgh. Publicity chairman: F. B. Mahon, Duquesne Light Co., Pittsburgh.

October 7-9. National Association of Corrosion Engineers: South-central regional meeting, Mayo hotel, Tulsa, Okla. Association address: 1061 M & M Bldg., Houston 2. Executive secretary: A. B. Campbell.

October 7-10. Pressed Metal Institute: Annual meeting, Bellevue-Stratford hotel, Philadelphia. Institute address: 2460 E. 130th St., Cleveland 20. Managing director: Orrin B. Wernitz.

October 8. American Iron & Steel Institute: Chicago regional technical meeting, Palmer House, Chicago. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

October 8-9. Rail Steel Bar Association: Fall meeting, Hotel Sheraton, St. Louis. Association address: 34 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

October 8-9. American Society For Quality Control Inc.: Midwest conference, Masonic Temple, Davenport, Iowa. Society address: 70 E. 45th St., New York 17. Secretary: Edward B. Haden.

October 8-9. National Conference on Industrial Hydraulics: Sheraton hotel, Chicago. Conference secretary: John G. Duba, Illinois Institute of Technology, 35 W. 33rd St., Technology Center, Chicago 16.

October 8-9. Gray Iron Founders Society Inc.: Annual meeting, Hotel Jefferson, St. Louis. Society address: 210 National City-E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.

October 11-15. Chamber of Commerce of the United States: Better business relations conference, Hotel Gearhart, Gearhart, Oreg. Chamber of Commerce address: 1615 H St., NW, Washington.

October 12-13. American Coke & Coal Chemicals Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 711-14th St., NW, Washington 5. Executive secretary: Samuel Weiss.

October 12-14. Packaging Institute: Annual meeting, Hotel Statler, New York. Institute address: 312 Madison Ave., New York 17. Executive director: Lawrence V. Burton.

October 12-14. National Association of Sheet Metal Distributors and American Hardware Manufacturers Association: Joint convention, Marlborough-Blenheim hotel, Atlantic City. Information: Thomas A. Fernley Jr., 1900 Arch St., Philadelphia 3.

October 12-17. Concrete Reinforcing Steel Institute: Semi-annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 34 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 13. Steel Joint Institute: Semi-annual meetings, The Greenbrier, White Sulphur Springs, W. Va. Institute address: Dupont Circle Bldg., Washington 6. Managing director: C. H. Luedeman.

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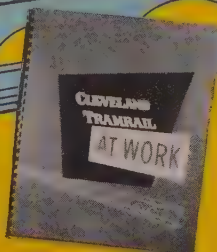
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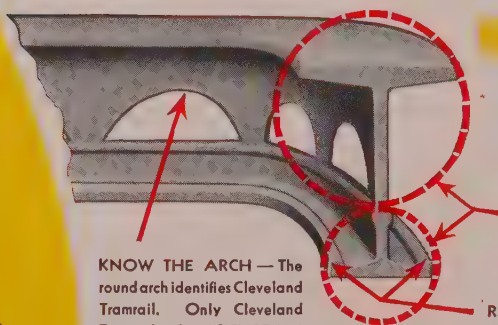
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1. THE FAMOUS ARCH BEAM

SEVEN SIZES—Seven sizes (8" to 18" deep), all with same rail width, enabling carriers to travel between any pair of beams.

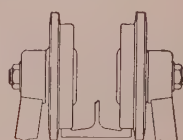
REDUCES WEIGHT—Arches reduce weight and help room lighting without sacrifice of strength.

COMPOUND SECTION—Made of two parts: Wide flanged mild steel beam welded to high-carbon Tramrail track with Brinell hardness of 225.

RAISED WEARING TREADS—Raised treads prevent peening and provide wear factor not obtainable with any other single-piece track. No separately mounted rails or wear treads to loosen and require maintenance.

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Wheels are drop forged steel with heat treated and hardened tread and flanges, having 425 Brinell hardness. Equipped with double-race type ball bearings. Wheels bear square on track. Permit easy swiveling on curves. Minimize propelling energy required.



MODERN TRAMRAIL WHEEL
AND TRACK DESIGN



Water Treatment for Corrosion Control

Iron and steel water systems can be protected by two methods. One involves removal or neutralization of factors favoring corrosion; the other reinforces inhibitors

By G. B. HATCH
President
Calgon Inc.
Pittsburgh

CONTROL of under-water corrosion in iron and steel water systems is generally easier than predicting the apparent corrosivity of a given water supply.

Of course, factors that favor or inhibit corrosion are well known, but how they cancel out is not sufficiently understood. Desired balance is set up by treatment.

Two methods of treatment are available: 1. Water constituents known to be responsible for corrosion can be removed or neutralized.

2. Known corrosion inhibiting factors can be reinforced. First method decreases corrosivity of the water; second makes the metal more resistant to corrosion by the formation of protective films on its surfaces.

No. 1 Enemy — Primary cause for corrosion in most water systems is dissolved oxygen. It's removed by mechanical or chemical de-aeration methods.

Both methods are employed in the treatment of boiler feedwater by using sulfite to remove last

traces of dissolved oxygen in effluent from the de-aerating heater. De-aeration also has been utilized in certain closed cooling systems, although relatively few are adequately sealed against atmosphere to make the control practical. De-aeration is rarely used for distribution and transmission mains, chiefly because of economic considerations.

Use of ammonia or volatile amines for the protection of condensate return lines is an example of materials which neutralize the corrosive constituent. Corrosive agent to be neutralized is free carbon dioxide resulting from decomposition of carbonates in boiler water.

Return Lines — Attack in condensate return lines is often localized. It may be severe in spots and practically nonexistent in others. Often severe grooving of the portion of the pipe in contact with the condensate may result.

Type of attack results from localization of areas where carbon diox-

ide is concentrated in the condensate. Much of the carbon dioxide will tend to stay in the vapor phase unless condensation is extensive, as in traps and lines used for injection heating.

Certain of the amines, cyclohexylamine and morpholine for example, have the advantage over ammonia for use in condensate returns. They do not attack copper if treatment rate becomes excessive. In general, neither ammonia nor these amines is particularly effective when oxygen leakage into the return lines is high.

Bacteria — Chlorine and other bactericides can function somewhat indirectly for the neutralization of a corrosive constituent. They are often used to kill sulfate reducing bacteria that produce corrosive hydrogen sulfide.

These bacteria produce hydrogen sulfide under anaerobic conditions. However, they still may cause trouble in an oxygen-bearing water. Accumulations of corrosion products or other debris upon

THE AMERICAN STORY

CHAPTER

13

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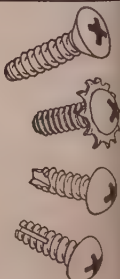
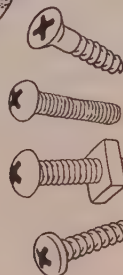


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STEEL

areas of the metal surface may shield them sufficiently to produce local anaerobic conditions. Sulfate reducing bacteria then can produce hydrogen sulfide in such areas.

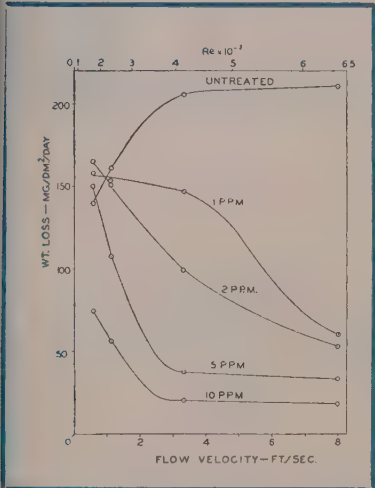
Inhibitors — More widely used types of inhibitors do not affect the actual corrosivity of the water to an appreciable extent. They increase resistance of the metal surface to attack. Water serves solely as a convenient means for the supply of these inhibitors to the metal surfaces.

Rate of formation of protective films upon metal surfaces is dependent largely upon the rate of supply of the inhibitor to these surfaces. Distribution may be by diffusion or by movement of the liquid relative to the solid surface.

Diffusion as a rate controlling factor is slow, particularly if distance to be covered is at all appreciable. Much more rapid means can be provided mechanically, as by agitation or flow of the liquid.

Coating Conditions — Type of flow in a system also has an important bearing upon supply of inhibitor to metal surfaces. Under strictly viscous or streamline flow conditions, little of the liquid actually contacts the pipe wall. Under turbulent flow conditions, a major portion of the liquid comes into intimate contact with metal surfaces.

Type and velocity of flow are



Curves show effect of increased velocity on steel tube corrosion rate, using treated and untreated tap water. Inhibitor used was a glyssy phosphate

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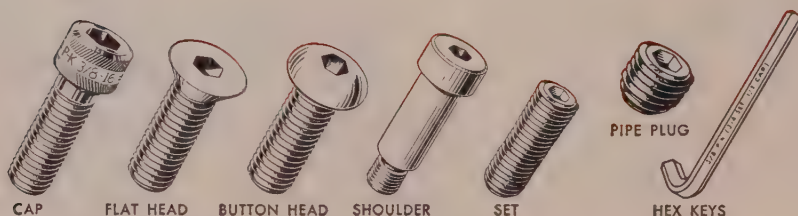
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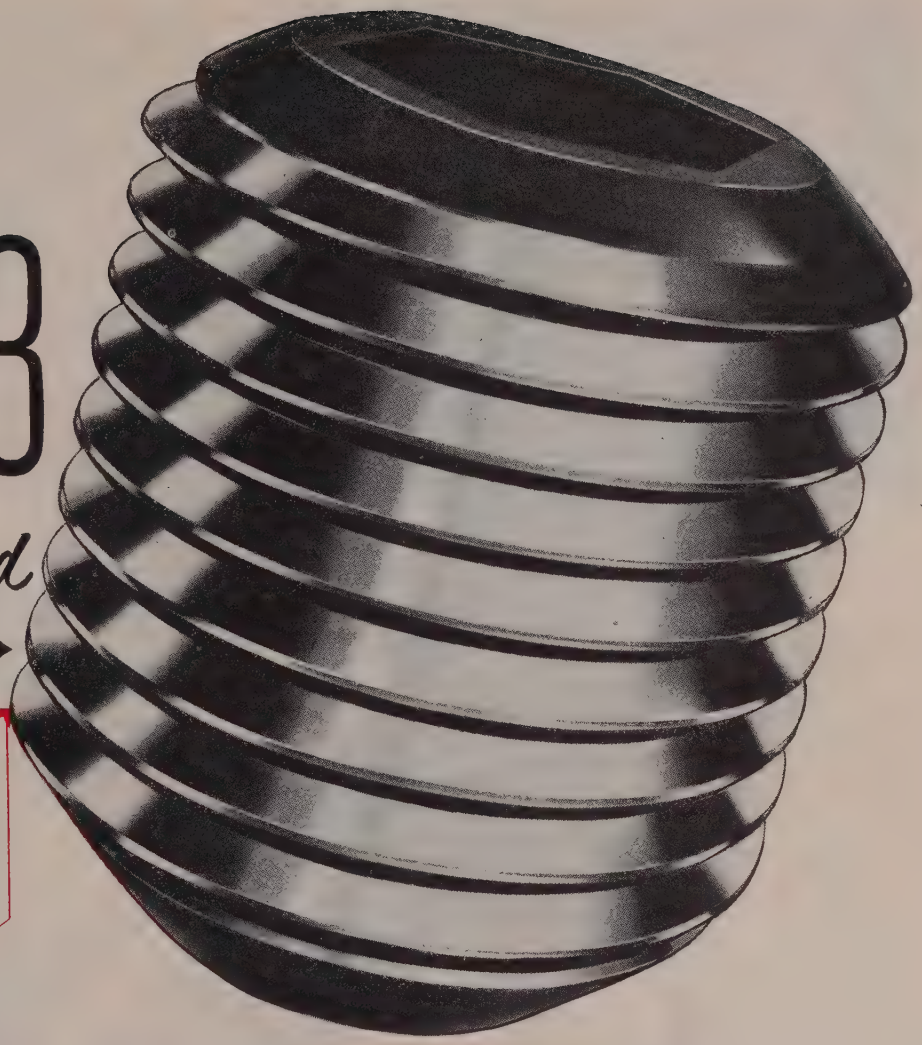
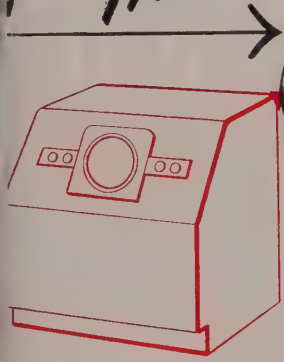
For SAMPLES, ask your P-K Distributor, or write: Parker-Kalon Corporation, 200 Varick St., New York 14.

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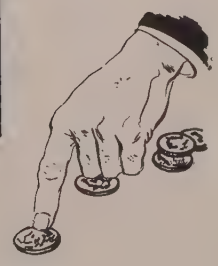
Ground Thread



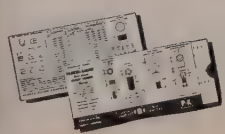
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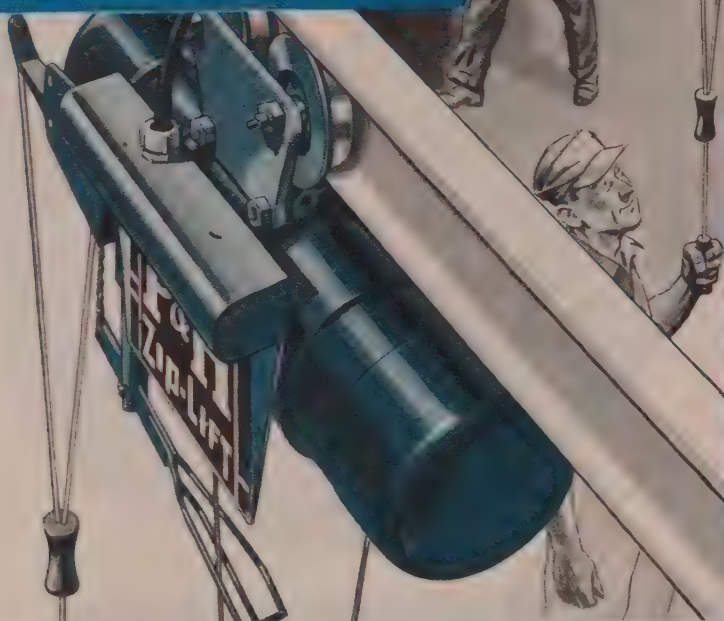
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WELDING EQUIPMENT



OVERHEAD CRANES

important even in the absence of inhibitors. They govern rate of supply of dissolved oxygen to the metal surface. General effect of increased velocity in an untreated system is to increase the corrosion rate, since oxygen is supplied more rapidly to the surfaces.

In certain less corrosive waters, the corrosion rate with untreated water will rise initially as the flow velocity increases. Then it will decrease. This decrease at higher velocities is a manifestation of the familiar dual role of oxygen in corrosion. At higher rates of flow, dissolved oxygen is supplied to the surface fast enough to maintain protective oxide film.

Presence of bacteria, slimes and algae in a water system can interfere with protective film formation, even though they release no specific corrosive constituents. They may accumulate on a surface and greatly hinder its access to inhibitors.

Condensate Films — Inhibitors which function by the formation of protective films upon metal surfaces also have been used for condensate return lines. Chief compounds used are amines. They are sufficiently volatile to pass over with steam when fed to the boiler. However, their action is different from that of the neutralization-type amines.

Film-forming amines are of the long-chain, high-molecular-weight type such as octadecylamine. In concentrations used (about 2 ppm), they neutralize little of the

carbon dioxide present. Films they deposit upon metal surfaces provide protection against both carbon dioxide and moderate concentrations of oxygen. Protection against oxygen attack is considerably more pronounced than results gained from simple elevation of pH.

Closed Systems — Term closed system is used rather loosely to designate cooling systems with practically no loss by evaporation. Relatively few are closed to air, and de-aeration is rarely practical.

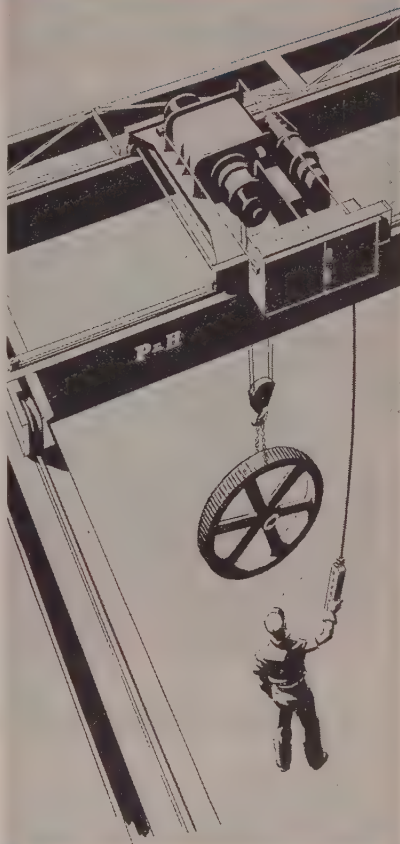
One of the more common examples of the closed type is the diesel cooling system. Wide variety of metals encountered, such as steel, aluminum, copper and its alloys and solder, present a challenging corrosion problem.

Chromate at a concentration of about 2000 ppm and pH of 6.5 to 9.5 has been used extensively with satisfactory results. Chief drawback to its use in diesel cooling systems is its toxicity. Disposal problem is posed if leakage is higher, and proper handling is required to avoid possible dermatitis.

Recirculating Systems — Corrosive conditions in open recirculating cooling systems generally are quite severe. Water is well aerated. Dissolved oxygen content closely reaches saturation. Rather high contents of dissolved salts may be reached as the water in the system concentrates. However, this is amenable to control by blow-down.

Circulating water also is sub-

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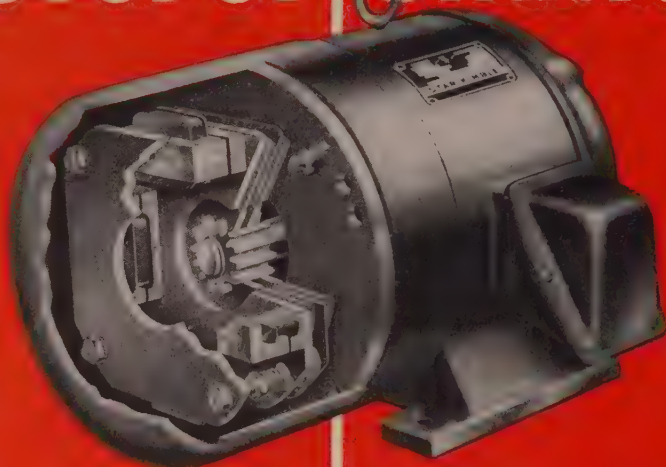
Water treated with slowly soluble phosphate glass flowed through pipe at left for 10 months. Section at right was exposed to untreated water for four months

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Severe grooving often results where pipe is in contact with condensate returns. This attack is localized

ject to contamination with gases and air-borne solids. Conditions in systems are quite favorable to bacterial and other biological growths. They generally necessitate control if adequate corrosion protection is to be attained with an inhibitor.

Recirculating cooling systems introduce a factor not often encountered in other water systems. Use of wooden cooling towers limits pH and concentration of alkaline sodium salts. Chlorine residuals also should not be excessive if chemical attack upon the wood is to be avoided.

Scale — Deposition of calcium carbonate scale for corrosion control has been tried in many recirculating cooling systems, but generally with limited results. Variation of temperature in different portions of the system makes it particularly difficult to obtain uniform scale deposition.

Chromates—When chromate is employed as the inhibitor in a recirculating cooling system, an initial concentration of 500 to 1000 ppm is generally recommended.

Chromate dosage is lowered during the succeeding few months, after which 200 to 400 ppm usually is maintained in the circulating water. Concentration generally is held fairly high to avoid pitting and localization of attack. Concentration of chromate employed is dependent upon the chloride content of the recirculating water. High chlorides increase the quantity of chromate needed.

The pH of circulating water usually is kept between 7.5 and 9.5 when chromate is used. At lower

(Continued on p. 194)

steel 1052 00 20 12 10

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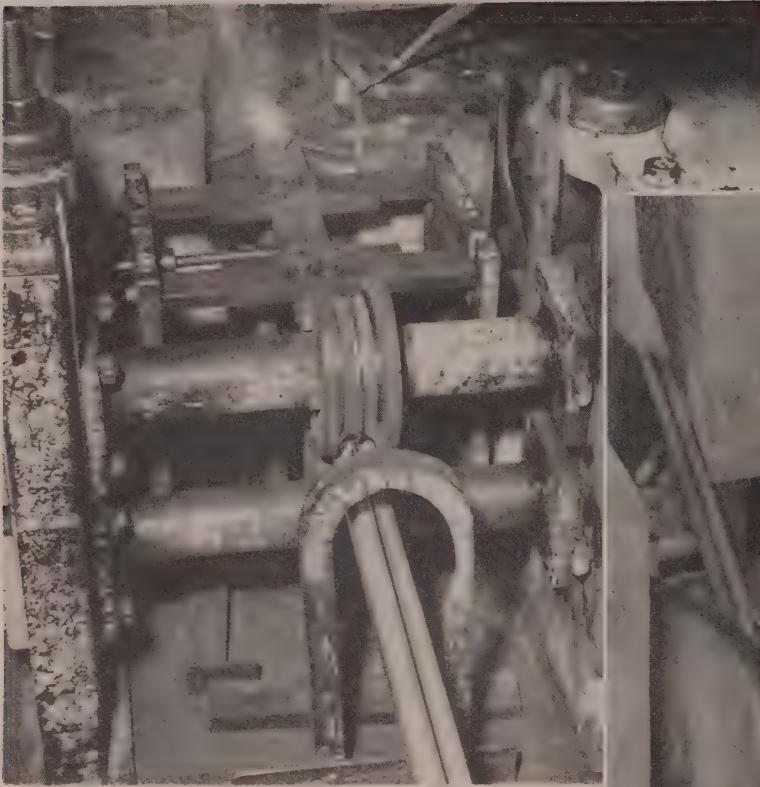
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Guide roll positions the butted edges of the tubing for accurate pass beneath welding machine. Closeup shows arc heatup point and squeeze rolls



Automatic Welding . . .

Improves Stainless Tube Output

While practically all stainless tube producers use inert-gas non-consumable electrode welding, only 50 or 60 per cent are doing it automatically. Trend is gaining momentum

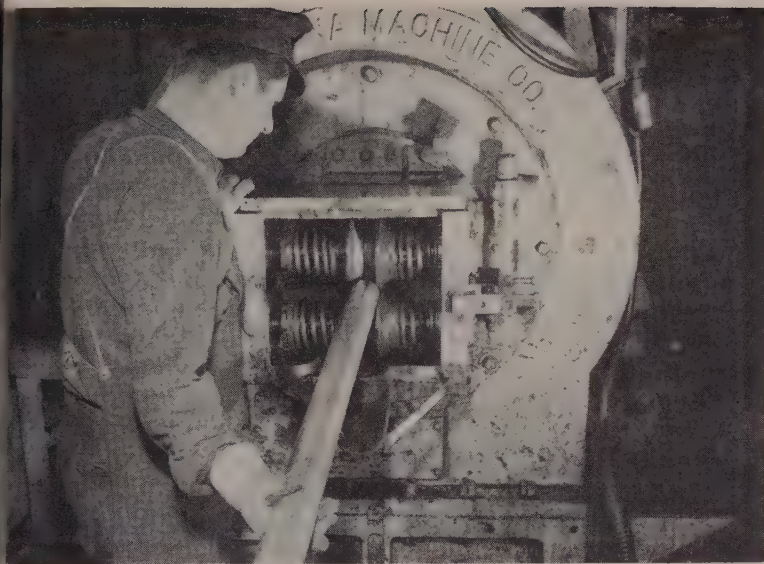
TWO MAJOR developments within the last 10 years have made fabrication of light gage stainless tubing easy, efficient and economical. Originally something of a problem to weld, inert-gas-shielded tungsten arc welding and automatic equipment for applying the process to volume repetitive jobs have put an end to the troubles.

Typical of current practice is the automatic setup at Damascus Tube Co., Greenville, Pa., where thousands of feet of corrosion-resistant pressure tubing are produced for a wide variety of uses.

Two Requirements—When a production welding job is of sufficient volume to justify use of fully-automatic equipment, two basic re-

quirements have to be met to achieve best results. Parts have to fit closely, and they have to be held in proper relationship by substantial jigs and fixtures. Equipment at Damascus does both.

In the forming process, flat cold-rolled stainless strip is fed continuously from coils through a series of contoured rolls which



Stainless steel tubing, 2½ inches in diameter with 0.065-inch wall, is fed into swaging machine where weld is carefully blended to OD and ID contours

gradually shape the steel into a pipe. Butted edges are welded together without filler metal to make a continuous wall. The inert-gas-welded tungsten arc process produces a homogeneous weld possessing substantially the same physical and corrosion-resistant properties as the parent metal.

Carbide Troubles—Carbide precipitation is an important problem when welding stainless steel. If the metal is kept at elevated temperatures for any length of time, it loses its corrosion-resistant properties because the carbon combines with the chromium. Carbide precipitation is minimized in the inert-gas process because high welding speeds reduce the area exposed to high temperatures.

The temperature is, of course, governed by current used which in turn is controlled by metal thickness. However, by using helium and dc straight polarity, high currents may be used and very high welding speeds employed. Thus, while the current is high the speed is such that only a narrow zone is exposed to temperatures which are conducive to carbide formation.

Fast Cooling — Further, with only a narrow zone heated, the cooling rate is rapid. Best results are obtained by the use of small electrodes (non-consumable) and fast travel speeds.

Damascus is using ⅛-inch diam-

eter thoriated tungsten with 25 cfh helium, 223 amps, and is getting a welding speed on 1½ x 0.120-inch wall, 304 stainless of 16 inches per minute minimum. Speeds of 96 ipm are obtainable on thinner sections.

Fast Work—Speed of welding is a function of the rate of heat input to the work and varies with the mass of metal being welded. Use of helium in this instance, which provides a hotter arc than

that obtained with argon, contributes to welding speed. Moreover, flux-free welding with no slag and spatter to clean up means additional time and labor savings.

After welding, the tubing is annealed and then fed through the swager, carefully blending the weld to the OD and ID contour. Operations which follow involve annealing for specified ductility, straightening, pickling and final inspection when each length is tested hydrostatically and mechanically for gage, size, tolerance, straightness and surface condition, both inside and out.

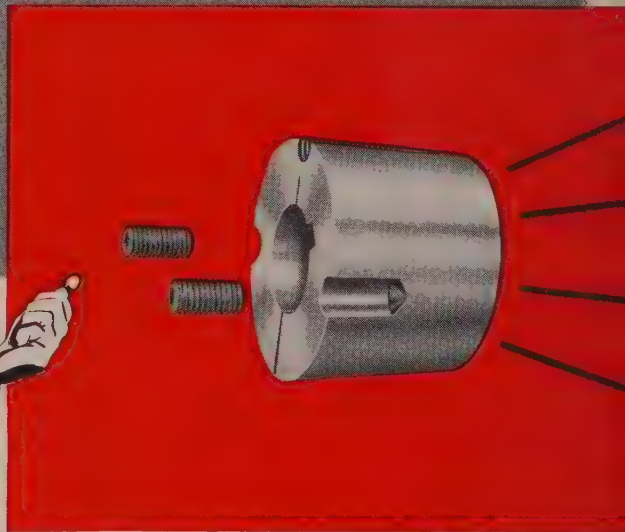
Old Method — Previously, Damascus used a mechanical method which involved the inert-gas-tungsten arc method without the benefits of automatic voltage (and arc length) control available in the automatic head. This automatic voltage control assures uniform penetration, hence permits the stepping up of welding speeds.

Automatic welding of stainless steel at Damascus reflects an important phase of the progress made in the fabrication of this material which was first produced on a commercial basis approximately twenty-five years ago. Particularly in the case of tube fabrication, where the joints on thin sections are very long, it is possible to obtain unprecedented welding speeds with this process.



White-pickle-finished tubing is here being inspected for gage, size, tolerance, straightness and conditions of surface, on both inside and outside

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The bushing pictured here fits into the hub of every one of the Dodge products shown—sprockets, sheaves, couplings, conveyor pulleys. Both tapered bushings and hubs are precision machined to achieve perfect interchangeability. The result is less down-time on machines, simpler maintenance, reduced inventories. Taper-Lock gives you an unmatched opportunity to lower your costs and keep production rolling.

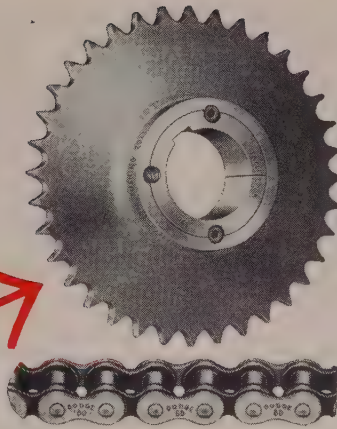
Dodge Taper-Lock grips the shaft for the full length of the bushing—holds with the firmness of a shrunk-on fit, yet comes off easily, quickly.

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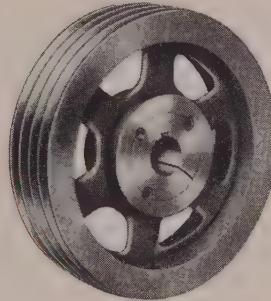
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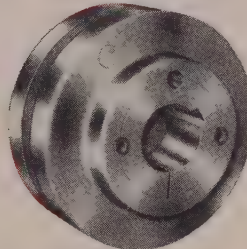
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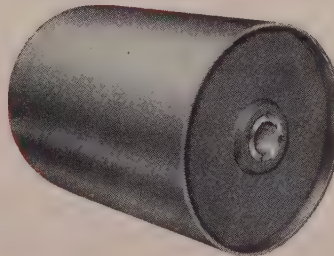
**TAPER-LOCK
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**— THE MODERN WAY
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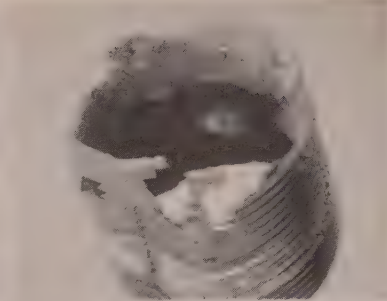
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Pits, left plate, mean bacteria did not let inhibitor reach the surface. Chlorination prevents this, right



Extreme corrosion of the pipe nipple shown above was result of air leakage into the condensate return line

(Continued from p. 188)

pH values, chromate consumption tends to increase because of its reduction by organic matter. The pH range used with chromate usually requires auxiliary treatment for control of calcium carbonate.

Chromic Products—Products of chromic acid and complex natural organic material are used for corrosion control in recirculating cooling systems. Analytical control generally is based upon the chromate. Somewhat lower concentrations usually are maintained than when chromate alone is used. Organic matter is apt to consume considerable chlorine. Use of other algacides and bactericides along with this treatment is indicated.

Problems of chromate waste disposal are intensified in recirculating cooling systems as a result of the rather large volumes of blow-down often required.

Glassy Phosphates—Glass phosphates are used for corrosion control in recirculating cooling systems. Maintenance of 10 to 15 ppm of molecularly dehydrated phosphate residual in the circulating water generally is recommended.

Optimum pH range for control of corrosion of iron and steel with glassy phosphates is from 5 to 7. One reason for the upper limit is to avoid localization of attack with attendant pitting and tuberculation characteristic of higher pH values. Second reason is to avoid calcium orthophosphate deposition.

Orthophosphate results from hydrolysis of some of the glassy phosphate. It is more noticeable in recirculating systems because of the relatively long retention of

the glass phosphate in the system. Added factor is that temperatures may be on the high side.

When pH adjustment involves feed of acid, care should be exercised to avoid excessive additions. If pH drops much below 5, a gradual removal of the protective film of glass phosphate on the metal surface takes place. Rate of film removal increases as pH is lowered.

Other Metals—Presence of additional metals in an iron or steel system often modifies the pH range for glassy phosphates. For example, minimum pH was upped to 6.5 to prevent attack upon inlet-ends of lake copper condenser tubes. In another case, a similar increase in minimum pH was required to prevent dezincification of brass flexible hoses. Thus, where certain copper alloys are involved, a pH of 6.7 to 7 is often preferable.

Circulating waters that deposit calcium carbonate scale and also cause corrosion trouble are encountered frequently. Although the scale deposition in these waters can be controlled by glassy phosphates without auxiliary treatment, corrosion control under these conditions may be inadequate. Better results can be obtained in these systems by addition of acid to lower pH to at least 7 for glass phosphate treatment.

Glass phosphates are quite insensitive to the presence of chlorides. This is of considerable advantage in many recirculating systems. High chloride content may be encountered in many such circulating waters.

Mixed Inhibitors—Mixtures of

the molecularly dehydrated phosphates (both glassy and crystalline varieties) with numerous other inhibitors have been used. They have been combined with chromates, silicates, organic materials, etc. Properties of such mixtures appear to be a combination of those of the individual components. A mixture of glass phosphate with an inhibitor can cause localization of attack if present in insufficient concentration tends to retain some of the property.

Preventive Maintenance Aid

Answering a demand for a hard overlay which could be applied with almost "skin thickness," Eutectic Welding Alloys Corp., Flushing, New York, has produced Eutec-Instant-Overlay (KR 6900) in both powder and paste form. The new product, the manufacturer claims, can actually be painted on the metal surface and, after the application of torch or carbon arc to melt the paste, bonds to the metal to form a "skin-thick" film of hard wear-resistant overlay (up to 65 Rockwell C).

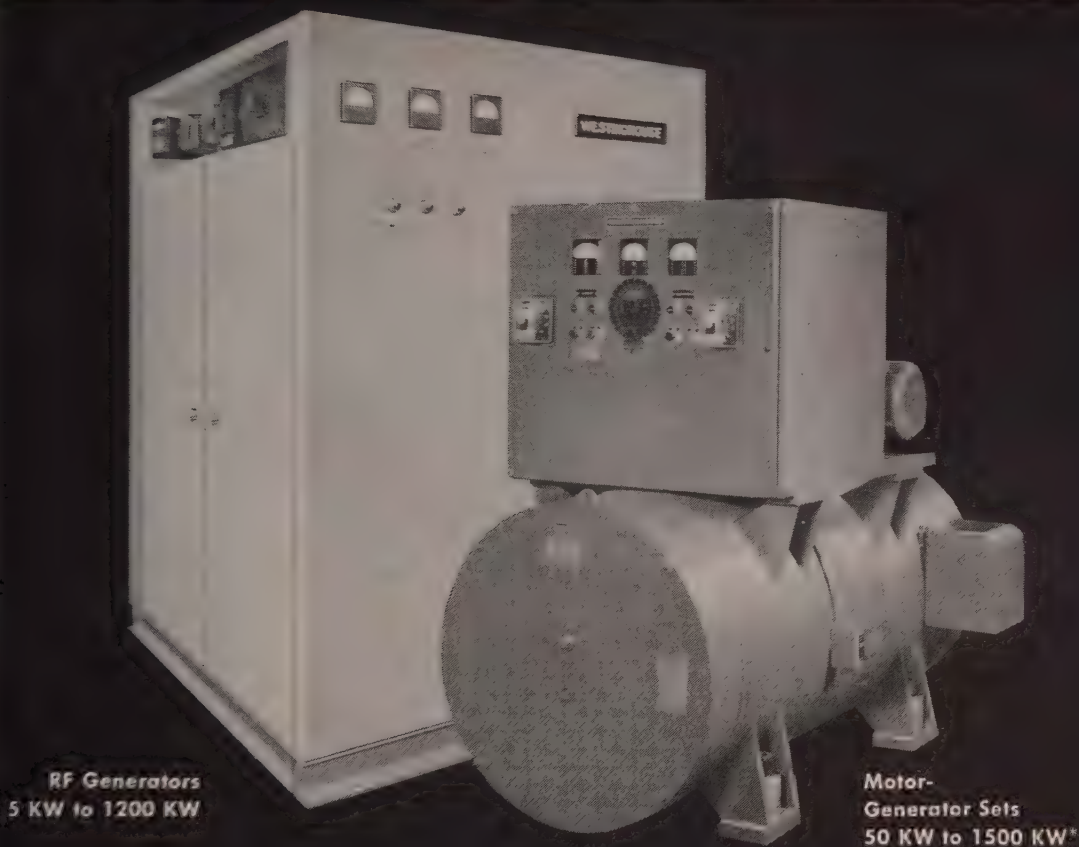
"KR 6900" can be applied either on new or old parts to yield increased life. Successive applications can be used to create a thicker film for even greater wear resistance.

It has applications in the field of maintenance work or preventive maintenance applications on elevator steps, ramps, fork trucks and similar farm and industrial applications.

In addition to this, the new Eutec-Instant-Overlay (KR 6900) has widespread use for application to new equipment . . . provides for increased life under abrasive conditions and other situations where a hard overlay of this type offers a solution.

Radioisotopes As Reagents

Development, application and instrumentation of the new microcurie radioisotopes is the subject of a bulletin, "Fisher Radioactive Reagents," just released by Fisher Scientific Co., Pittsburgh. These are the budget-priced carbon-14 tagged compounds that require no AEC authorization for use.



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SPEED CASE STEEL PLATE MAKES AMES A HARDNESS TESTER A BETTER INSTRUMENT

A Model 4 Ames Portable Hardness Tester, manufactured by Ames Precision Machine Works, Waltham, Mass., is shown above. The dial is direct reading, indicating Rockwell A, B or C scale hardness on thicknesses up to 4".

Frame of the Ames Model 4, and several other models, is machined from Speed Case, A1515, low carbon, open heart, steel plate, supplied in flame cut blanks, as shown at right. The machined frame, is shown in lower view, after magnifier retaining arm (1) and dial support (2) have been silver soldered to frame.

Speed Case has proved ideal for this application for three reasons: (1) Available flame cut to close tolerance. (2) Ease of machining, longer tool life, more readily polished and (3) Superior physical properties rendering it more suitable for a precision instrument.

Produce one of the Speed Steels—Speed Case, Speed Treat or Speed Alloy—can cut your costs while improving your product. **Send for literature.**



Speed Steels

SINCE 1854
W. J. HOLLIDAY & CO.

SPEED ALLOY • SPEED CASE • SPEED TREAT

DISTRIBUTED BY

Brown-Wales Co., Cambridge-Hartford-Auburn, - Bridgeport Steel Co., Milford, Conn.
Beals, McCarthy & Rogers, Buffalo, N. Y. - Burger Iron Co., Akron, Ohio - Grammer,
Dempsey & Hudson, Inc., Newark, N. J. - Earle M. Jorgensen Co., Los Angeles-Houston
Oakland-Dallas - Passaic County Steel Service, Inc., Paterson, N. J. - Pectover's Ltd.,
Montreal-Toronto - Peninsular Steel Co., Detroit, Mich. - Pidgeon-Thomas Iron Co., Mem-
phis, Tenn. - Horace T. Potts Co., Philadelphia-Baltimore-York, Pa.

Produced by W. J. Holliday & Co., The Speed Steel Plate Division,
Hammond, Indiana - Plants: Hammond and Indianapolis, Indiana



High-Speed Hand Spray

Manufacturers of porcelain cast iron sanitary fixtures usually spray patterns with copper, then finish to size. Since patterns are large it is necessary to develop equipment that gains high spraying speeds. Metallizing Co. of America adapted an foot flexible extension to its Maguetric gun to produce equipment that hand-sprays 3/16-inch wire 50 per cent faster

Broaching Brake Shoes

Reduced loading and unloading time, thereby speeding broaching operation on automotive brake shoes, plus pneumatic positioning and hydraulic clamping are combined on a Colonial Broach Co. model. The machine a standard dual-ram 10-ton 5-inch stroke, with specially designed shuttle fixtures. Insert-type broaches cut a slot at one end and a concave at the other at a rate of 400 brake shoes per hour.

Single manual control of three pneumatic cylinders enables the brake shoe to be positioned accurately against three stops. Release of the part is just as fast, after broaching.

Hydraulic clamping with a single cylinder actuating a saddle clamp, is an integral part of the automatic broaching cycle. Since there are two shuttle fixtures, one can be loaded and unloaded while the other is going through the broaching cycle.

Stock removal on both the 1/2-inch slot and the 3/32-inch concave is 13/32-inch maximum. Thickness is 13/32-inch at concave and 3/16-inch at the slot.

1052 00 00 00 00



4-HIGH 6-STAND

CONTINUOUS HOT STRIP MILL

DESIGNED AND BUILT BY

UNITED

ENGINEERING AND FOUNDRY COMPANY

MINNEAPOLIS, MINN.

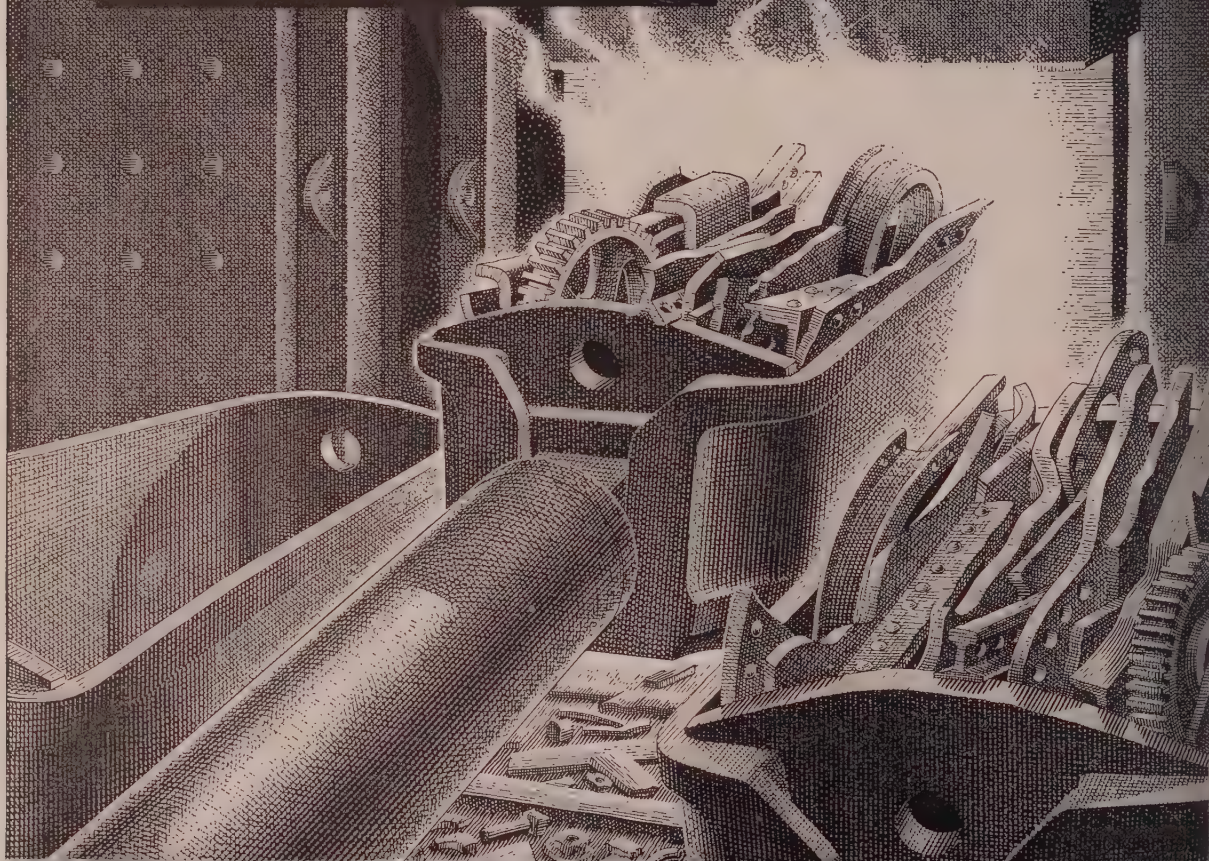
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ERIE, PENNA.



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BOSTON, MASS. HOUSTON, TEXAS PUEBLO, COLORADO
BUFFALO, N. Y. LEBANON, PENNA. READING, PENNA.
CHICAGO, ILLINOIS LOS ANGELES, CAL. ST. LOUIS, MO.
CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.
SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

September. 21, 1953

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[illegible]

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Sept. 15

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1.....	\$4.400	Bars, H.R., alloy	\$5.675	Strip, C.R., stainless, 430 (lb)	\$0.415	Tin plate, hot-dipped, 1.25 lb	\$3.433
Rails, light, 40 lb	5.767	Bars, H. R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.113	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, C.R., carbon	4.830	Pipe, black, butt weld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., butt weld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., alloy	11.075	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.345
Plates, carbon	4.550	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, carbon (100 ft)	149.518	Bale ties (bundle)	5.633
Structural Shapes	4.383	Sheets, H.R., carbon	4.765	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.530
Bars, tool steel, carbon (lb)	0.415	Sheets, C.R., carbon	5.904	Tubes, boiler (100 ft)	†	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, galvanized	6.945	Tubing, mechanical, carbon (100 ft)	†	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, C.R., stainless, 302 (lb)	0.548	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W18, Cr 4, V 1 (lb)	1.730	Sheets, electrical	9.183				
		Strip, G.R., carbon	7.371				

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 15 1953	Sept. 8 1953	Month Ago	Aug. Average
(1947-1949=100)	141.7	141.7	141.7	141.7

STEEL'S FINISHED STEEL PRICE INDEX

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)...	159.33	159.33	159.33	181.31	143.08
Index in cents per lb.	5.130	5.130	5.130	4.912	3.876

STEEL'S ARITHMETICAL PRICE COMPOSITE*

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Finished Steel, NT	\$115.56	\$115.56	\$115.56	\$110.98	\$95.05
No. 2 Fdry, Pig Iron, GT.	56.54	56.54	56.54	55.04	44.30
Basic Pig Iron, GT.	56.04	56.04	56.04	54.68	43.86
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	44.68
Steelmaking Scrap, GT.	37.50	38.67	43.17	43.00	43.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54 of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh ...	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia 5.303	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.25
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia. 4.38	4.38	4.38	4.38	4.13	3.45
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md. 4.10	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh ...	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh. ...	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.75	3.275
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.125
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.15
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.15
Tin plate (1.50 lb), box, Pitts. \$8.95	\$8.95	\$8.95	\$8.95	\$8.95	\$6.70

PIG IRON, Gross Ton

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bessemer, Pitts.	\$57.00	\$57.00	\$57.00	\$55.50	\$47.00
Basic, Valley	56.00	56.00	56.00	54.50	43.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	46.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	43.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	43.50
No. 2 Fdry, deld. Phila. ...	61.25	61.25	61.25	59.75	46.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Clin. 60.43	60.43	60.43	60.43	58.93	49.06
Malleable, Valley	56.50	56.50	56.50	55.00	43.50
Malleable, Chicago	56.50	56.50	56.50	55.00	43.50
Ferromanganese, Duquesne. 200.00†	200.00†	200.00†	200.00†	228.00†	148.00

*78-82% Mn, per gross ton, Eliza, Pa. 774-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
No. 1 Heavy Melt, Pitts. ...	\$40.50	\$41.50	\$45.50	\$44.00	\$42.7
No. 1 Heavy Melt, E. Pa. ...	36.50	39.00	42.50	41.50	45.5
No. 1 Heavy Melt, Chicago ...	35.50	35.50	41.50	42.50	41.7
No. 1 Heavy Melt, Valley ...	36.50	39.50	45.50	44.00	42.7
No. 1 Heavy Melt, Cleve. ...	33.50	35.50	44.50	43.00	42.2
No. 1 Heavy Melt, Buffalo. ...	39.50	41.50	43.75	43.00	46.2
Rails, Rerolling, Chicago. ...	52.00	52.00	56.00	52.50	63.2
No. 1 Cast, Chicago	35.00	35.00	42.00	48.50	70.0

COKE, Net Ton

	Sept. 17 1953	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Beehive, Furn, Connsvl. ...	\$14.73	\$14.73	\$14.73	\$14.75	\$14.2
Beehive, Fdry, Connsvl. ...	16.75	16.75	16.75	17.00	17.0
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.4

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99% plus, ingots 21.50, pigs 20.00, 10,000 lbs or more, f.o.b. shipping point. Freight allowed on 500 lb or more.
Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.
Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in

bulk. Foreign brands, 99.5%, 25.50-28.00 New York, duty paid, 10,000 lb or more.
Beryllium: 97%, lump or beads, \$71.50 per lb f.o.b. Cleveland or Reading, Pa.
Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa.
Beryllium Copper: 3.75-4.25% Be, \$40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$2.00 per lb de Cobalt: 97-99%, \$2.40 per lb for 560 lb ke \$2.42 per lb for 100 lb case; \$2.47 per lb for 100 lb.

Columbium: Powder, \$75.00 per lb, nom.

Copper: Electrolytic 29.00-30.00 deld. Col Valley, 29.125-30.125 deld. Midwest; Ls 30.125 deld.; Fire refined 29.75 deld. Germanium: 99.9%, \$350.00 per lb nom.

Gold: U. S. Treasury, \$35 per oz.

Iridium: 99.9%, \$2.25 per troy oz.

Iridium: \$165-\$175 per troy oz.

Lead: Common 13.30, chemical 13.90, e roding 13.90, St. Louis, New York basis, 0.20.

Lithium: 98%, \$10-\$13 per lb, depending quantity.

Magnesium: 99.8% standard ingots 27.00, 1 000 lb or more, f.o.b. Freeport, Tex. Std 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: A291B 30.50; A291C 30.50; C, H, G and R 32.50; alloy M 34, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Sept. 17	Last Change	Previous Price	Aug. Ave.	July Ave.	Aug. 1952 Ave.
Copper	29.00-30.00	Aug. 19	28.50-30.00	29.375	29.846	24.500
Lead	13.30	Sept. 16	13.80	13.500	13.483	15.800
Zinc	10.00	Sept. 11	10.50	11.000	11.000	14.067
Tin	81.00 nom.	Sept. 17	81.125	80.530	81.577	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum ..	21.50	July 15	20.50	21.500	20.923	19.923
Magnesium ..	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99% plus, deld.; Magnesium, 99.8%, Freeport, Tex.

7: Open market, spot, New York.
191 per 76-lb flask.

Aluminum: Powder, 99% hydrogen reduced
per lb; pressed ingot \$4.06 per lb;
d ingot \$5.53 per lb.

Electrolytic cathodes, sheets (4 x 4 in.
rger), unpacked, 60.00; 25-lb pigs 62.65;
nickel shot 63.65; "P" nickel shot or
for, for addition to cast iron 60.00; prices
Port Colborne, Ont., including import
New York basis, add 0.82.

Aluminum: \$140-\$150 per tray oz. nom.

Aluminum: \$23-\$24 per tray oz.

Aluminum: \$91-\$93 per tray oz. from refineries.
Aluminum: \$16.00-\$21.50 per mg. radium content,
depending on quantity.

Aluminum: \$125 per tray oz.

Aluminum: \$80-\$85 per tray oz.

Aluminum: 99.5%, \$4.25-\$4.75 per lb.

Aluminum: 18.50, carlots; 17.00 l.c.l.

Aluminum: Sheet, rod \$42.45 per lb; powder
\$4.0 per lb.

Aluminum: \$1.75 per lb.

Aluminum: \$12.50 per lb.

Aluminum: Straits, New York, \$1.00 nom.

Aluminum: 98.8%, carbon reduced, 1000
lbs \$5.35 per lb deld.; less than 1000 lb
99% plus hydrogen reduced \$6.40.
Aluminum: 10.43 per lb.

Aluminum: Price western 10.00, brass special 10.25,
mediate 10.50, E. St. Louis, freight
over 0.50 per pound. High grade
special high grade 11.50, die casting
ingot 14.50, deld.

Aluminum: Sponge \$14.00 per lb; powder 100
lb more \$7.00; less than 100 lb \$8.00.
Aluminum: Chromium, manganese and silicon met-
als are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys 22.00-22.50;
12 foundry alloy (No. 2 grade) 21.50-
22.00; 5% silicon alloy, 0.60 Cu max., 23.25-
23.50; 13 alloy, 0.60 Cu max., 23.00-23.50;
alloy 22.00-23.50; 108 alloy 22.00-22.50;
1 deoxidizing grades, notch bars, granu-
led or shot: Grade 1, 21.75-23.50; grade 2,
19.25-21.75; grade 3, 19.75-20.25; grade 4,
20.25-20.00.

Aluminum Ingot: Red brass, No. 115, 24.50; tin
brass, No. 225, 35.25, No. 245, 29.50; high-
tensile tin bronze, No. 305, 28.75; No. 1
copper, No. 405, 20.75; manganese bronze No.
25, 25.25.

Aluminum Alloy Ingot: AZ63A, 31.50; AZ91B,
30; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

Copper Wire
Wire, soft, f.o.b. eastern mills, 100,000 lb lots,
36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weath-
erproof, 100,000 lb, 36.28; 30,000 lb, 36.58;
l.c.l. 37.08. Magnet wire deld., 15,000 lb or
more 41.83; l.c.l., 42.58.

Lead
Prices to jobbers f.o.b. Buffalo, Cleveland,
Asbury, Sheets, full rolls, 140 sq ft or
more \$18.50 per cwt; pipe, full coils \$15.50
per cwt; traps and bends, list prices plus 30%.

Titanium
Prices per lb, 10,000 lb and over, f.o.b. mill)
Sheets, \$15; sheared mill plate, \$12; strip, \$15;
rod, \$10; forging billets, \$6; hot-rolled and
forged bars, \$6.

Zinc
Sheets 23.00, f.o.b. mill, 36,000 lb and over.
Aluminum zinc in coils, 19.50-20.50, f.o.b. mill,
36,000 lb and over. Plates 19.50-20.75.

Nickel, Monel, Inconel
"A" Nickel Monel Inconel
Sheet, C.R. ... 86.5 87.5 92.5
Strip, C.R. ... 92.5 90.5 98.5
Plate, H.R. ... 84.5 86.5 90.5
Ingot, Shapes ... 82.5 85.5 88.5
Seamless Tubes 115.5 100.5 137.5
Hot, Blocks ... 60.0

RASS MILL PRICES

Sheet, Strip, Plate
Copper ... 48.38b 45.98c
Yellow Brass ... 41.72 41.66 42.28 44.63
Red Brass, 85% ... 45.44 45.33 45.98 48.25
Yellow Brass, 80% ... 44.47 44.41 45.01 47.28
Naval Brass ... 45.76 40.07 52.80 48.92
Commercial Bronze, 90% ... 46.95 46.89 47.49 49.51
Nickel Silver, 10% ... 55.36 59.43g 57.69
Phosphor Bronze, A, 5% ... 66.58 67.08 68.23
Silicon Bronze ... 52.71 51.90 52.75 70.11e
Manganese Bronze ... 49.48 43.62 54.06
Muntz Metal ... 43.96 39.77

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn.
d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping
point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb, g. Leaded.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more.)

Sheets and Circles: 2S and 3S mill finish c.l.c.

Thickness Range	Widths or Flat Diameters, In.	Flat Sheet Base*	Coiled Sheet Base	Circle Sheet Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	...	...
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., widths or diameters 24-60 in., lengths 72-240 in.

Alloy	Plate Base	Circle Base
2S-F	32.4	38.3
50S-F	33.5	37.4
48-F	34.5	39.1
52S-F	36.2	40.9
61S-F	37.4	41.9
24S-F	39.3	45.4
75S-F*	47.1	53.7

* Widths or diameters 24-48 in., lengths 72-180 in.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round		Hexagonal	
	11S-T3	17S-T4	11S-T3	17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.8	48.9	...	...
0.188	50.8	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.898	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Roller				
1.563	42.7	41.0	...	...
1.875-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4 in. thick, widths 0.750-10 in.

Industrial Roofing Sheet (0.032-in. thick): Flat, 42.75 in. wide, lengths 60-144 in., \$2.838 to \$6.816 per sheet. Corrugated, 35 in. wide, lengths 60-144 in., \$2.862 to \$6.874 per sheet.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 103.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, 1/4-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, 1/4 x 2 in. 69.20, 1 x 4 in. 63.00, Rod, 1 in. 66.00, 2 in. 62.50, Tubing, 1 in. OD x 0.065-in. 87.00, Angles, 1 x 1 x 1/4-in. 72.90, 2 x 2 x 1/4-in. 67.00, Channels, 5 in. 67.80, 1-Beams, 6 in. 66.20

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 10.00, mixed clippings 10.00; old sheet 9.00; borings and turnings 6.50; pistons and struts 6.50; crankcases 9.00; industrial castings 9.00

Copper and Brass: Heavy copper and wire, No. 1 21.00; No. 2 copper 18.50-19.50; light copper 16.50; No. 1 composition red brass 15.00; No. 1 composition turnings 14.50; mixed brass turnings 9.00; new brass clippings 15.50 nom.; No. 1 brass rod turnings 13.00 nom.; light brass 9.00; heavy yellow brass 11.00; new brass rod ends 17.50 nom.; auto radiators, unsweated 11.00; cocks and faucets 13.00; brass pipe 14.50.

Lead: Heavy 9.50-10.00; battery plate 5.25-5.75; linotype and stereotype 11.75; electrotype 10.50; mixed babbitt 12.00.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 28.00-30.00; old sheet 26.00-27.00; turnings 19.00-21.00; rods 25.00-30.00.

Nickel: Sheets and clips 80.00; rolled anodes 50.00; turnings 50.00; rod ends 80.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.00-15.50; 518, 523 clippings 15.00-15.50; 148, 178, 248, clippings 14.00-14.50; mixed clippings 14.00-14.50; old sheet 12.50-13.00; old cast, 12.50-13.00; clean old cable, free of steel 14.50-15.50; borings and turnings 13.00-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 23.50 nom.; No. 2 copper 21.50; light copper 20.00; refinery brass (60% copper) per dry copper content 18.50; auto radiators 13.00 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 23.00-23.50; No. 2 copper 21.50; light copper 20.00; No. 1 composition borings 16.50; No. 1 composition solids 17.25; heavy yellow brass solids 13.00; yellow brass turnings 12.25; radiators 13.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes \$2.15 per lb.

Conner: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb 99.05; 200-499 lb 98; 500-999 lb 97.5; 1000 lb or more 97.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: \$2.15 per lb. in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulfate: 100-8000 lb 11.35; 8000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulfate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,900 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 15 oz 80.825; 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 65.2; 100-600 lb 51.40; 700-1900 lb 48.9; 2000-9900 lb 47.10; 10,000 lb or more 46.

Stannous Chloride (Anhydrous): Less than 50 lb \$1.497, 50 lb \$1.157; 100-300 lb \$1.007, 400-900 lb 92.2; 1000-1900 lb 95.8; 2000-4900 lb 92.1; 5000-19,000 lb 88; 20,000 lb and over 79.9.

Stannous Sulfate: Less than 50 lb \$1.20; 50 lb 90; 100-1900 lb 88; 2000 lb and over 86.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Pressure for tariff protection mounts as imports put price squeeze on domestic miners. Among most active proponents are zinc and lead producers

TARIFF TALK is being revived as imports put the price squeeze on domestic miners.

Producers of zinc and lead are the most active proponents of an increased levy on metal coming in from abroad. After zinc price was cut a half-cent on Sept. 11 to 10 cents, E. St. Louis, the metal was at its lowest point in three and a half years.

Lead is in a similar but less precarious position. Pegged at 14 cents on July 23 after a climb from the year's low of 12 cents on Apr. 20, lead succumbed last week to heavier offerings of metal abroad and reduced buying. The price slipped a half-cent to 13.50, New York basis, in a custom smelter initiated move. High for the year in lead was the 14.75-cent level on Jan. 2.

Protectionists—A number of industries are supporting, overtly or covertly, various appeals for tariff protection. Fear of competition from foreign materials or goods is a normal accompaniment of the evening up of prices and demand. Effects of the stock market slide are of psychological importance.

Latest tariff proposal came from the National Lead and Zinc Committee, which seeks relief under escape clause provisions of the Trade Agreements Extension Act. The group, headed by Otto Herres, vice president, Combined Metals Reduction Co., wants a 50 per cent increase in duties over those prevailing at the beginning of 1945, before reciprocal trade agreements came into effect.

Quotas Too—The petition filed with the Tariff Commission also suggests import quotas be established—350,000 tons of lead and 300,000 tons of zinc, in metallic content. With these measures enacted, an annual U. S. mine production of 700,000 tons of zinc and 400,000 tons of lead is believed possible. The committee proposed that if the price of either climbed beyond 15 cents the import quotas be suspended.

Duty on slab zinc would be boosted to 2.1 cents a pound from the present 0.7, zinc ore and concentrates would have a duty of 1.8 cents, compared with the present 1.0625, and on ore the rate would be 1.8 cents, as against 0.75 cent now in effect.

Sliding Scale — The hotly-debated

sliding scale tax proposed in Congress earlier this year may get another look, too. Andrew Fletcher, president of St. Joseph Lead Co. and American Institute of Mining and Metallurgical Engineers, said the plan fundamentally seems "to be the best one for consumers and miners," and "it would not be too difficult to work out details as to what was a proper price basis." Zinc imports this year are running about 75 per cent over the 1952 rate.

Other metals could face the same problem. Some steel men are worrying aloud about incoming shipments. Brass mills are in trouble moving some products because of volume imports, especially in free cutting brass rods used for screw machine parts. Copper men note the sizable tonnages sold here in days of shortage and while Chile is out of the market. They may grow in importance as the market slips.

No Overproduction — One example can be found in a letter to stockholders of Copper Range Co. President Morris W. LaCroix said that while there is no apparent overproduction of copper and its products in this country his company had to meet "effective and direct" competition from foreign copper and products of foreign rolling mills.

In Washington hearings before the Committee for Reciprocity Information, U. S. industries ranging from common pins to garlic powder sought to impress their views on government representatives attending the Geneva meeting of the General Agree-

ment on Tariffs and Trade. Under present rules, members of that Agreement will be free after Jan. 1, 1954, to withdraw individual tariff concessions without canceling a whole agreement. A number of participants seek to push this date back on grounds a big increase in tariffs in practically all markets of the world would result.

Trading Remains Quiet

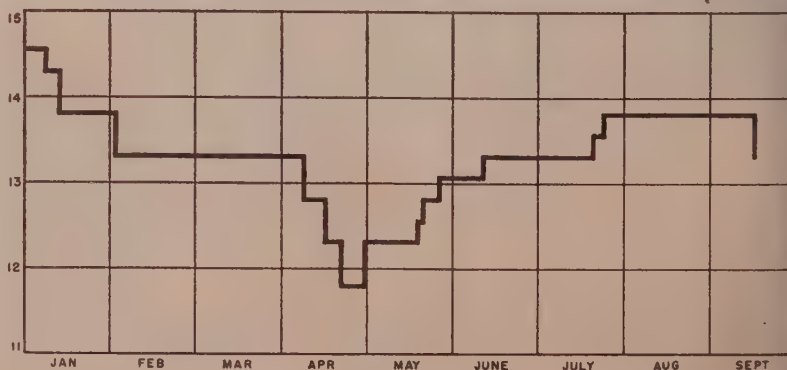
Trading of nonferrous metals remains quiet outside of lead and zinc where price changes cause abnormalities. Copper men are waiting for the drawn-out negotiations on Chilean copper to conclude. Aluminum seller note a falling off in demand for some manufactured products, chiefly screw machine stock, ACSR transmission cable and farm building products. The biggest tonnage item, sheet, is selling well on forward orders and foil business has improved remarkably. Tin prices slipped several cents in the week, with prompt winding up about 81 cents.

Showcase of Ideas

Dedicated in Pittsburgh last week was a showcase of ideas for aluminum in the building industry. The 30-floor Alcoa building, lightest structure for its size ever built, was completed in a little over three years. Among the building innovation claimed are exterior walls of 6 x 12 foot aluminum panels and reversible aluminum window frames. Ceiling wiring, lighting, partition framing, rooftop cooling tower, interior trim, elevator cabs and most of the plumbing are made of the light metal. Architects take note.

LEAD SINKS AGAIN

1953 Prices in Cents Per Pound, Common Grade, St. Louis

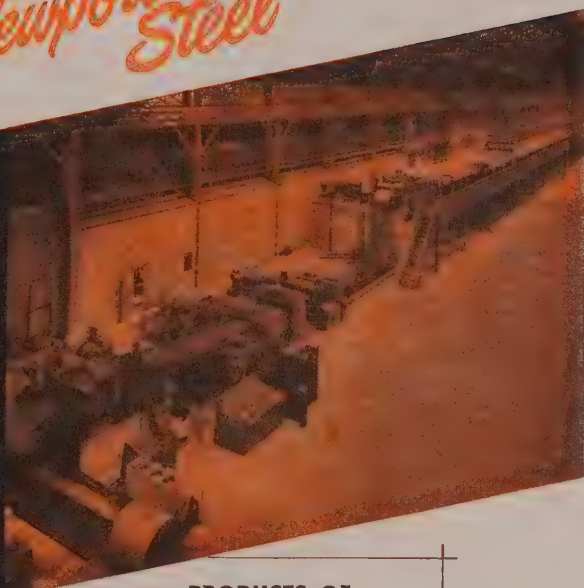


CONTINUOUS PICKLING UNIT

added at

Newport Steel

The first new facility completed this year in Newport's program of progress is a \$3,000,000 continuous pickling line. Customers now may secure still another high-quality end-product in the form of hot-rolled pickled steel in coil from Newport's unique reversing hot mill, which started rolling in 1949. Other additions include electric furnaces, another soaking pit, electric weld pipe mill, and river barge loading facilities. These modern improvements plus 68 years of steelmaking experience make Newport an increasingly dependable source for your volume requirements.



PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets
- Roofing and Siding
- Eave Trough and Conductor Pipe
- Culverts



ECONOMICAL WATER/RAIL DELIVERY

Newport Steel is situated on the Mississippi-Ohio River system and the great Cincinnati rail hub. With the advantage of location, new river barge facilities and seven major railroads, Newport gives economical, dependable delivery to industrial areas throughout the Middle West and South.

Newport Steel

CORPORATION
NEWPORT, KENTUCKY

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on page 205. Key to footnotes, page 207

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana, Calif. K1 ...\$36.00
Munhall, Pa. U5 ...\$59.00

INGOTS, Alloy (NT)
Detroit R7\$63.00
Fontana, Calif. K1\$83.00
Midland, Pa. C18\$2.00
Munhall, Pa. U5\$2.00

BILLETS, BLOOMS & SLABS

Carbon Rolling (NT)

Alliquippa, Pa. J5\$62.50
Bessemer, Pa. U5\$2.00
Clairton, Pa. U5\$2.00
Ensley, Ala. T2\$2.00
Fairfield, Ala. T2\$2.00
Fontana, Calif. K1\$1.00
Gary, Ind. U5\$2.00
Johnstown, Pa. B2\$2.00
Lackawanna, N.Y. B2\$2.00
Munhall, Pa. U5\$2.00
So. Chicago, Ill. U5\$2.00
So. Duquesne, Pa. U5\$2.00

Carbon, Forging (NT)

Alliquippa, Pa. J5\$75.50
Bessemer, Pa. U5\$75.50
Buffalo R2\$75.50
Canton, O. R2\$75.50
Clairton, Pa. U5\$75.50
Cleveland R2\$75.50
Conshohocken, Pa. A3\$2.50
Detroit R7\$75.50
Ensley, Ala. T2\$75.50
Fairfield, Ala. T2\$75.50
Fontana, Calif. K1\$75.50
Gary, Ind. U5\$75.50
Geneva, Utah C11\$75.50
Houston S5\$75.50
Johnstown, Pa. B2\$75.50
Lackawanna, N.Y. B2\$75.50
Los Angeles B3\$75.50
Munhall, Pa. U5\$75.50
Seattle B3\$75.50
So. Chicago, R2, U5, W14\$75.50
So. Duquesne, Pa. U5\$75.50
So. San Francisco B3\$75.50

Alloy, Forging (NT)

Bethlehem, Pa. B2\$82.00
Buffalo R2\$82.00
Canton, O. R2\$82.00
Canton, O. T7\$84.00
Conshohocken, Pa. A3\$89.00
Detroit R7\$89.00
Fontana, Calif. K1\$89.00
Gary, Ind. U5\$82.00
Houston S5\$82.00
Ind. Harbor, Ind. Y1\$82.00
Johnstown, Pa. B2\$82.00
Lackawanna, N.Y. B2\$82.00
Los Angeles B3\$102.00
Massillon, O. R2\$82.00
Midland, Pa. C18\$82.00
Munhall, Pa. U5\$82.00
So. Chicago, R2, U5, W14\$82.00
So. Duquesne, Pa. U5\$82.00
Struthers, O. Y1\$82.00
Warren, O. C17\$82.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2\$92.50
Canton, O. R2\$92.50
Cleveland R2\$92.50
Fontana, Calif. K1\$113.50
Gary, Ind. U5\$92.50
Massillon, O. R2\$92.50
So. Chicago, Ill. R2\$92.50
So. Duquesne, Pa. U5\$92.50

SHEET BAR (NT)

Fontana, Calif. K1\$93.18

SKELP

Alliquippa, Pa. J5\$3.85
Munhall, Pa. U5\$3.75
Warren, O. R2\$3.75
Youngstown R2, U5\$3.75

WIRE RODS

Alabama City, Ala. R2\$4.525
Alliquippa, Pa. J5\$4.525
Alton, Ill. L1\$4.70
Buffalo W12\$4.525
Cleveland A7\$4.525
Donora, Pa. A7\$4.525
Fairfield, Ala. T2\$4.525
Fontana, Calif. K1\$5.325
Houston S5\$4.525
Johnstown, Pa. B2\$4.525
Joliet, Ill. A7\$4.525
Kansas City, Mo. S5\$4.865
Los Angeles B3\$5.325
Minneapolis, Colo. C10\$4.775
Monessen, Pa. P7\$4.775
No. Tonawanda, N.Y. B11\$4.525
Pittsburgh, Calif. C11\$5.175
Portsmouth P12\$4.525

Roebling, N.J. R5\$4.625
So. Chicago, Ill. R2\$4.525
Sparrows Point, Md. B2\$4.625
Sterling, Ill. (1) N15\$4.525
Struthers, O. Y1\$4.525
Torrance, Calif. C11\$5.325
Worcester, Mass. A7\$4.625

—STRUCTURALS—

Carbon Steel Stand. Shapes

Alabama City, Ala. R2\$4.10
Alliquippa, Pa. J5\$4.10
Bessemer, Ala. T2\$4.10
Bethlehem, Pa. B2\$4.10
Clairton, Pa. U5\$4.10
Fairfield, Ala. T2\$4.10
Fontana, Calif. K1\$4.75
Gary, Ind. U5\$4.10
Geneva, Utah C11\$4.10
Houston S5\$4.60
Ind. Harbor, Ind. I-2\$4.10
Johnstown, Pa. B2\$4.15
Kansas City, Mo. S5\$4.80
Lackawanna, N.Y. B2\$4.15
Los Angeles B3\$4.80
Minneapolis, Colo. C10\$4.55
Munhall, Pa. U5\$4.10
Niles, Calif. (22) P1\$4.91
Phoenixville, Pa. P4\$4.95
Seattle B3\$4.85
So. Chicago, Ill. U5, W14\$4.10
So. San Francisco B3\$4.75
Torrance, Calif. C11\$4.80
Weirton, W. Va. W6\$4.35

Wide Flange

Bethlehem, Pa. B2\$4.15
Clairton, Pa. U5\$4.10
Fontana, Calif. K1\$5.30
Lackawanna, N.Y. B2\$4.15
Munhall, Pa. U5\$4.10
So. Chicago, Ill. U5\$4.10

Alloy Stand. Shapes

Clairton, Pa. U5\$5.00
Fontana, Calif. K1\$6.40
Gary, Ind. U5\$5.00
Munhall, Pa. U5\$5.00
So. Chicago, Ill. U5\$5.00

H.S., L.A. Stand. Shapes

Alliquippa, Pa. J5\$6.175
Bessemer, Ala. T2\$6.175
Bethlehem, Pa. B2\$6.20
Clairton, Pa. U5\$6.175
Fairfield, Ala. T2\$6.175
Fontana, Calif. K1\$6.825
Gary, Ind. U5\$6.175
Geneva, Utah C11\$6.175
Ind. Harbor, Ind. I-2\$6.175
Ind. Harbor, Ind. Y1\$6.875
Johnstown, Pa. B2\$6.20
Lackawanna, N.Y. B2\$6.20
Los Angeles B3\$6.85
Munhall, Pa. U5\$6.175
Seattle B3\$6.90
So. Chicago, Ill. U5, W14\$6.175
So. San Francisco B3\$6.80
Struthers, O. Y1\$6.875

H.S., L.A. Wide Flange

Bethlehem, Pa. B2\$6.20
Lackawanna, N.Y. B2\$6.20
Munhall, Pa. U5\$6.125
So. Chicago, Ill. U5\$6.125

BEARING PILES

Munhall, Pa. U5\$4.10
So. Chicago, Ill. U5\$4.10

—PILING—

STEEL SHEET PILING

Ind. Harbor, Ind. I-2\$4.925
Lackawanna, N.Y. B2\$4.925
Munhall, Pa. U5\$4.925
So. Chicago, Ill. U5\$4.925

—PLATES—

PLATES, Carbon Steel

Alabama City, Ala. R2\$4.10
Alliquippa, Pa. J5\$4.10
Ashland, Ky. (15) A10\$4.10
Bessemer, Ala. T2\$4.10
Clairton, Pa. U5\$4.10
Claymont, Del. C22\$4.55
Cleveland J5, R2\$4.10
Coatesville, Pa. L7\$4.35
Conshohocken, Pa. A3\$4.55
Ecorse, Mich. G5\$4.65
Fairfield, Ala. T2\$4.10
Fontana, Calif. (30) K1\$4.75
Gary, Ind. U5\$4.10
Geneva, Utah C11\$4.10
Granite City, Ill. G4\$4.60
Harrisburg, Pa. C5\$4.95
Houston S5\$4.60
Ind. Harbor, Ind. I-2, Y1\$4.10
Johnstown, Pa. B2\$4.10

Lackawanna, N.Y. B2\$4.10
Minneapolis, Colo. C10\$4.95
Munhall, Pa. U5\$4.10
Pittsburgh J5\$4.10
Riverdale, Ill. A1\$5.00
Seattle B3\$5.00
Sharon, Pa. S3\$4.10
So. Chicago, Ill. U5, W14\$4.10
Sparrows Point, Md. B2\$4.10
Steubenville, O. W10\$4.10
Warren, O. R2\$4.10
Weirton, W. Va. W6\$4.40
Youngstown R2, U5, Y1\$4.10

PLATES, Carbon A.R.

Fontana, Calif. K1\$5.90
Geneva, Utah C11\$5.25

PLATES, Wrought Iron

Economy, Pa. B14\$9.30

PLATES, High-Strength Low-Alloy

Alliquippa, Pa. J5\$6.25
Bessemer, Ala. T2\$6.25
Clairton, Pa. U5\$6.25
Cleveland J5\$6.25
Conshohocken, Pa. A3\$6.50
Ecorse, Mich. G5\$7.10
Fairfield, Ala. T2\$6.25
Fontana, Calif. (30) K1\$6.25
Gary, Ind. U5\$6.25
Geneva, Utah C11\$6.25
Ind. Harbor, Ind. I-2\$6.25
Ind. Harbor, Ind. Y1\$6.75
Johnstown, Pa. B2\$6.25
Lackawanna, N.Y. B2\$6.25
Munhall, Pa. U5\$6.25
Pittsburgh J5\$6.25
Seattle B3\$7.15
Sharon, Pa. S3\$6.25
So. Chicago, Ill. U5, W14\$6.25
Sparrows Point, Md. B2\$6.25
Youngstown J5\$6.25
Youngstown Y1\$6.75

PLATES, Alloy

Claymont, Del. C22\$5.65
Coatesville, Pa. L7\$5.75
Fontana, Calif. K1\$6.60
Gary, Ind. U5\$5.55
Johnstown, Pa. B2\$5.55
Munhall, Pa. U5\$5.55
Sharon, Pa. S3\$5.70
So. Chicago, Ill. U5, W14\$5.55
Sparrows Point, Md. B2\$5.55

FLOOR PLATES

Cleveland J5\$5.15
Conshohocken, Pa. A3\$5.15
Ind. Harbor, Ind. I-2\$5.15
Munhall, Pa. U5\$5.15
So. Chicago, Ill. U5\$5.15

PLATES, Ingot Iron

Ashland, c.l. (15) A10\$4.35
Ashland, c.l. (15) A10\$4.85
Cleveland, c.l. R2\$4.70
Warren, O. c.l. R2\$4.70

—BARS—

BARS, Hot-Rolled Carbon

Alabama City, Ala. R2\$4.15
Alliquippa, Pa. J5\$4.15
Alton, Ill. L1\$4.50
Atlanta, Ga. A11\$4.40
Bessemer, Ala. T2\$4.15
Buffalo R2\$4.15
Canton, O. R2\$4.15
Clairton, Pa. U5\$4.15
Cleveland R2\$4.15
Detroit R7\$4.30
Ecorse, Mich. G5\$4.50
Emeryville, Calif. J7\$4.90
Fairfield, Ala. T2\$4.15
Fontana, Calif. K1\$4.85
Gary, Ind. U5\$4.15
Houston S5\$4.65
Ind. Harbor, Ind. I-2, Y1\$4.15
Johnstown, Pa. B2\$4.15
Kansas City, Mo. S5\$4.85
Lackawanna, N.Y. B2\$4.15
Los Angeles B3\$4.85
Milton, Pa. B6\$4.55
Minneapolis, Colo. C10\$4.60
Niles, Calif. P1\$4.85
No. Tonawanda, N.Y. B11\$4.15
Pittsburgh, Calif. C11\$4.85
Pittsburgh J5\$4.15
Portland, Ore. O4\$4.90
Seattle B3, N14\$4.90
So. Chicago, R2, U5, W14\$4.15
So. Duquesne, Pa. U5\$4.15
So. San Francisco, Calif. B3\$4.90
Sterling, Ill. (1) N15\$4.15
Struthers, O. Y1\$4.15
Torrance, Calif. C11\$4.85
Weirton, W. Va. W6\$4.30
Youngstown R2, U5\$4.15

BARS, Hot-Rolled Alloy

Bethlehem, Pa. B2\$4.875
Buffalo R2\$4.875
Canton, O. T7\$4.875
Canton, O. R2\$4.875
Clairton, Pa. U5\$4.875
Detroit R7\$4.975
Ecorse, Mich. G5\$5.225
Fontana, Calif. K1\$5.925
Gary, Ind. U5\$4.875
Houston S5\$5.375
Ind. Harbor, Ind. I-2, Y1\$4.875
Johnstown, Pa. B2\$4.875
Kansas City, Mo. S5\$5.575
Lackawanna, N.Y. B2\$4.875
Los Angeles B3\$5.925
Massillon, O. R2\$4.875
Midland, Pa. C18\$4.875
So. Chicago, R2, U5, W14\$4.875
So. Duquesne, Pa. U5\$4.875
Struthers, O. Y1\$4.875
Warren, O. C17\$4.875
Youngstown U5\$4.875

BARS & SMALL SHAPES, H.R.

High-Strength Low-Alloy

Alliquippa, Pa. J5\$6.225
Bessemer, Ala. T2\$6.225
Bethlehem, Pa. B2\$6.225
Clairton, Pa. U5\$6.225
Ecorse, Mich. G5\$6.875
Fairfield, Ala. T2\$6.225
Fontana, Calif. K1\$7.475
Gary, Ind. U5\$6.225
Ind. Harbor, Ind. Y1\$6.725
Ind. Harbor, Ind. I-2\$6.225
Johnstown, Pa. B2\$6.225
Lackawanna, N.Y. B2\$6.225
Los Angeles B3\$6.925
Pittsburgh J5\$6.975
So. Chicago, W14\$6.225
So. Duquesne, Pa. U5\$6.225
So. San Francisco B3\$6.975
Struthers, O. Y1\$6.725
Youngstown U5\$6.225

BAR SIZE ANGLES; H.R. CARBON

Bethlehem, Pa. B2\$4.35

BAR SIZE ANGLES; S. Shapes

Alliquippa, Pa. J5\$4.15
Atlanta A11\$4.40
Niles, Calif. P1\$4.85
San Francisco S7\$5.10

BAR SHAPES, Hot-Rolled Alloy

Clairton, Pa. U5\$5.00
Fontana, Calif. K1\$6.00
Gary, Ind. U5\$5.00
Houston S5\$5.70
Kansas City S5\$5.90
Youngstown U5\$5.00

BARS, Cold-Finished Carbon

Ambridge, Pa. W18\$5.20
Beaver Falls, Pa. M12, R2\$5.20
Buffalo B5\$5.25
Camden, N.J. P13\$5.65
Carnegie, Pa. C12\$5.20
Chicago W18\$5.20
Cleveland A7, C20\$5.20
Detroit P17, R7\$5.35
Detroit B5\$5.40
Donora, Pa. A7\$5.20
Elyria, O. W8\$5.20
Franklin Park, Ill. N5\$5.20
Gary, Ind. R2\$5.20
Green Bay, Wis. F7\$5.185
Hammond, Ind. L2, M13\$5.20
Hartford, Conn. R2\$5.75
Harvey, Ill. R2\$5.20
Los Angeles R2\$5.75
Mansfield, Mass. B5\$5.75
Massillon, O. R2, R3\$5.20
Monaca, Pa. S17\$5.20
Newark, N.J. W18\$5.65
New Castle, Pa. (17) B4\$5.20
Pittsburgh J5\$5.20
Plymouth, Mich. P5\$5.45
Putnam, Conn. W18\$5.75
Readville, Mass. C14\$5.75
St. Louis, Mo. M5\$5.50
So. Chicago, Ill. W14\$5.20
Spring City, Pa. K3\$5.55
Struthers, O. Y1\$5.20
Wauekan, Ill. A7\$5.20
Worcester, Mass. W19\$5.20
Youngstown F3, Y1\$5.20

BARS, Cold-Finished Carbon

(Turned and Ground)

Cumberland, Md. (5) C19\$4.45

BARS, Cold-Finished Alloy

Ambridge, Pa. W18\$6.325
Beaver Falls, Pa. M12\$6.325
Bethlehem, Pa. B2\$6.325
Buffalo B5\$6.325
Camden, N.J. P13\$6.50
Canton, O. R2\$6.325
Canton, O. T7\$6.29
Carnegie, Pa. C12\$6.00

SHEETS

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

Alabama City, Ala. R2\$25
Ashland, Ky. (8) A10\$25
Butler, Pa. A10\$25
Cleveland J5, R2\$25
Conshohocken, Pa. A3\$25
Detroit M1\$25
Ecorse, Mich. G5\$25
Fairfield, Ala. T2\$25
Fairless, Pa. U5\$25
Fontana, Calif. K1\$25
Gary, Ind. U5\$25
Geneva, Utah C11\$25
Granite City, Ill. G4\$25
Ind. Harbor, Ind. I-2, Y1\$25
Irvin, Pa. U5\$25
Lackawanna, N.Y. B2\$25
Munhall, Pa. U5\$25

Chicago W18\$6
Cleveland A7, C20\$6
Detroit P7\$6
Detroit B5\$6
Detroit B7\$6
Donora, Pa. A7\$6
Elyria, O. W8\$6
Gary, Ind. R2\$6
Hammond, Ind. L2, M13\$6
Hartford, Conn. R2\$6
Harvey, Ill. B5\$6
Lackawanna, N.Y. B2\$6
Mansfield, Mass. B5\$6
Massillon, O. R2, R3\$6
Midland, Pa. C18\$6
Monaca, Pa. S17\$6
Newark, N.J. W18\$6
Plymouth, Mich. P5\$6
So. Chicago, Ill. R2, W14\$6
Spring City, Pa. K3\$6
Struthers, O. Y1\$6
Warren, O. C17\$6
Wauekan, Ill. A7\$6
Worcester, Mass. A7\$6
Youngstown F3, Y1\$6

BARS, Reinforcing (Fabricate)

Alabama City, Ala. R2\$5
Atlanta A11\$5
Buffalo R2\$5
Cleveland R2\$5
Emeryville, Calif. J7\$5
Fairfield, Ala. T2\$5
Fontana, Calif. K1\$5
Gary, Ind. U5\$5
Houston S5\$5
Ind. Harbor, Ind. I-2, Y1\$5
Johnstown, Pa. B2\$5
Kansas City, Mo. S5\$5
Lackawanna, N.Y. B2\$5
Los Angeles B3\$5
Milton, Pa. B6\$5
Minneapolis, Colo. C10\$5
Niles, Calif. P1\$5
Pittsburgh, Calif. C11\$5
Pittsburgh J5\$5
Sand Springs, Okla. S5\$5
Seattle B3, N14\$5
So. Chicago, Ill. R2\$5
So. Duquesne, Pa. U5\$5
So. San Francisco B3\$5
Sparrows Point, Md. B2\$5
Sterling, Ill. (1) N15\$5
Struthers, O. Y1\$5
Torrance, Calif. C11\$5
Youngstown R2, U5\$5

BARS, Reinforcing

(Fabricated; to consumer)

Johnstown, 1/2" B2\$5
Kansas City S5\$5
Los Angeles B3\$5
Marion, O. P11\$5
Seattle N14\$5
Seattle B3\$5
So. San Francisco B3\$5
Sparrows Point, 1/2" B2\$5
Williamsport, Pa. S19\$5

RAIL STEEL BARS

Avia, Pa. (4) J8\$70
Chicago Hts. (3) C2\$70
Chicago Hts. (3) C2\$70
Chicago Hts. (3) C2\$70
Fort Worth, Tex. (26) T4\$70
Franklin, Pa. (3) F5\$70
Franklin, Pa. (4) F5\$70
Marion, O. (3) P11\$70
Moline, Ill. (3) R2\$70
Tonawanda (3) B12\$70
Williamsport, Pa. (3) S19\$70
Williamsport, Pa. (4) S19\$70

BARS, Wrought Iron

Economy, Pa. (S.R.) B14\$30
Economy, Pa. (D.R.) B14\$30
Economy (Staybolt) B14\$30
McK. Rks. (Staybolt) L5\$30
McK. Rks. (S.R.) L5\$30
McK. Rks. (D.R.) L5\$30

—SHEETS—

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

Alabama City, Ala. R2\$25
Ashland, Ky. (8) A10\$25
Butler, Pa. A10\$25
Cleveland J5, R2\$25
Conshohocken, Pa. A3\$25
Detroit M1\$25
Ecorse, Mich. G5\$25
Fairfield, Ala. T2\$25
Fairless, Pa. U5\$25
Fontana, Calif. K1\$25
Gary, Ind. U5\$25
Geneva, Utah C11\$25
Granite City, Ill. G4\$25
Ind. Harbor, Ind. I-2, Y1\$25
Irvin, Pa. U5\$25
Lackawanna, N.Y. B2\$25
Munhall, Pa. U5\$25

BARS, Wrought Iron

Economy, Pa. (S.R.) B14\$30
Economy, Pa. (D.R.) B14\$30
Economy (Staybolt) B14\$30
McK. Rks. (Staybolt) L5\$30
McK. Rks. (S.R.) L5\$30
McK. Rks. (D.R.) L5\$30

—SHEETS—

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

Alabama City, Ala. R2\$25
Ashland, Ky. (8) A10\$25
Butler, Pa. A10\$25
Cleveland J5, R2\$25
Conshohocken, Pa. A3\$25
Detroit M1\$25
Ecorse, Mich. G5\$25
Fairfield, Ala. T2\$25
Fairless, Pa. U5\$25
Fontana, Calif. K1\$25
Gary, Ind. U5\$25
Geneva, Utah C11\$25
Granite City, Ill. G4\$25
Ind. Harbor, Ind. I-2, Y1\$25
Irvin, Pa. U5\$25
Lackawanna, N.Y. B2\$25
Munhall, Pa. U5\$25

BARS, Wrought Iron

Economy, Pa. (S.R.) B14\$30
Economy, Pa. (D.R.) B14\$30
Economy (Staybolt) B14\$30
McK. Rks. (Staybolt) L5\$30
McK. Rks. (S.R.) L5\$30
McK. Rks. (D.R.) L5\$30

—SHEETS—

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

Alabama City, Ala. R2\$25
Ashland, Ky. (8) A10\$25
Butler, Pa. A10\$25
Cleveland J5, R2\$25
Conshohocken, Pa. A3\$25
Detroit M1\$25
Ecorse, Mich. G5\$25
Fairfield, Ala. T2\$25
Fairless, Pa. U5\$25
Fontana, Calif. K1\$25
Gary, Ind. U5\$25
Geneva, Utah C11\$25
Granite City, Ill. G4\$25
Ind. Harbor, Ind. I-2, Y1\$25
Irvin, Pa. U5\$25
Lackawanna, N.Y. B2\$25
Munhall, Pa. U5\$25

BARS, Wrought Iron

Economy, Pa. (S.R.) B14\$30
Economy, Pa. (D.R.) B14\$30
Economy (Staybolt) B14\$30
McK. Rks. (Staybolt) L5\$30
McK. Rks. (S.R.) L5\$30
McK. Rks. (D.R.) L5\$30

—SHEETS—

SHEETS, Hot-Rolled Steel

(18 gage and heavier)

Alabama City, Ala. R2\$25
Ashland, Ky. (8) A10\$25
Butler, Pa. A10\$25
Cleveland J5, R2\$25
Conshohocken

Nile J, N12	.....4.425
Pis arg, Calif. C11	.....4.625
Pis arg J5	.....3.925
Rb lala, Ill. A1	.....3.925
Sir a, Pa. S3	.....4.225
So. Chicago, Ill. W14	.....3.925
SpringsPoint, Md. B2	.....3.925
Swanville, O. W10	.....3.925
Tw nce, Calif. C11	.....4.625
W n, O. R2	.....3.925
W n, W. Va. W6	.....3.925
Y gstown U5, Y1	.....3.925

SH S, H.R. (19 gage)

Al lmaCity, Ala. R2	.....5.225
D v, O. R1	.....5.975
M eld, O. B8	.....5.80
N e, O. N12	.....5.20
T nce, Calif. C11	.....5.875

SH S, H.R. (14 ga. heavier)**High-Strength Low-Alloy**

Cl and J5, R2	.....5.90
Conshohocken, Pa. A3	.....6.15
D se, Mich. T2	.....5.90
F n, Ala. T2	.....5.90
F n, Calif. K1	.....7.00
G r, Ind. U5	.....5.90
H r, Harbor, Ind. I-2	.....5.90
H r, Harbor, Ind. Y1	.....8.40
I r, Pa. U5	.....5.90
L a, wanna (35) B2	.....5.90
M hall, Pa. U5	.....5.90
M burgh J5	.....5.90
M n, Pa. S3	.....5.90
M icago, Ill. U5	.....5.90
M rowsPoint (38) B2	.....5.90
M n, O. R2	.....5.90
M n, W. Va. W6	.....5.90
M gstown U5	.....5.90
M gstown Y1	.....6.40

TS, Hot-Rolled Ingot Iron**8 Gage and Heavier**

land, Ky. (8) A10	.....4.175
eland, R2	.....4.525
Harbor, Ind. I-2	.....4.175
ren, O. R2	.....4.525

ETS, Cold-Rolled Steel**(Commercial Quality)**

er, Pa. A10	.....4.775
eland J5, R2	.....4.775
se, Mich. G5	.....4.975
rfield, Ala. T2	.....4.775
ress, Pa. U5	.....4.875
ansbee, W. Va. F4	.....5.775
ana, Calif. K1	.....5.875
y, Ind. U5	.....4.775
IndCity, Ill. G4	.....5.275
Harbor, Ind. I-2, Y1	.....4.775
n, Pa. U5	.....4.775
akawanna, N.Y. B2	.....4.775
ddetown, O. A10	.....4.775
tsburg, Calif. C11	.....5.725
tsburgh J5	.....4.775
arrowsPoint, Md. B2	.....4.775
renville, O. W10	.....4.775
uben, O. R2	.....4.775
elton, W. Va. W6	.....4.775
ngstown Y1	.....4.775

ETS, Cold-Rolled**High-Strength Low-Alloy**

eland J5, R2	.....7.225
ons, Mich. G5	.....7.675
ntana, Calif. K1	.....3.275
y, Ind. U5	.....7.225
iana Harbor, Ind. Y1	.....7.225
n, Pa. U5	.....7.225
akawanna (37) B2	.....7.225
tsburgh J5	.....7.225
arrowsPoint (38) B2	.....7.225
ren, O. R2	.....7.225
elton, W. Va. W6	.....7.475
ngstown Y1	.....7.725

ETS, Cold-Rolled Ingot Iron**8 Gage and Heavier**

ter, Pa. A10	.....5.275
eland R2	.....5.375
ddetown, O. A10	.....5.275
ren, O. R2	.....5.375

ETS, Gal'd No. 10 Steel

AlabamaCity, Ala. R2	.....5.275
ashland, Ky. (8) A10	.....5.275
anton, O. R2	.....5.275
over, O. R1	.....5.275
arfield, Ala. T2	.....5.275
ary, Ind. U5	.....5.275
raniteCity, Ill. G4	.....5.475
rd, Harbor, Ind. I-2	.....5.325
vin, Pa. U5	.....5.275
okomo, Ind. (13) C16	.....5.375
arlinsFerry, O. W10	.....5.275
lls, O. N12	.....5.80
ttaburg, Calif. C11	.....6.025
ttaburg, Pa. S3	.....5.45
parrowsPoint, Md. B2	.....5.275
teubenville, O. W10	.....5.275
rrance, Calif. C11	.....6.275
elton, W. Va. W6	.....6.275

Based on 5c zinc.

SHEETS, Galvanized No. 10**High-Strength Low-Alloy**

Irvin, Pa. U5	.....7.925
SparrowsPoint (39) B2	.....8.075

SHEETS, Galvanized Ingot Iron**No. 10 flat**

Ashland, Ky. (8) A10	.....5.525
Canton, O. R2	.....6.025

SHEETS, Culvert

Alloy	Cu	Fe
Ashland, Ky. A10	6.325	.....
Canton, O. R2	6.475	6.925
Fairfield T2	6.075	6.325
Gary, Ind. U5	6.075	6.325
Ind. Harbor I-2	6.075	6.325
Irvin, Pa. U5	6.075	6.325
Kokomo, Ind. C16	6.525	.....
Martins Ferry, O. W10	6.075	.....
Pitts, Cal. C11	6.825	.....
SparrowsPt. B2	6.075	.....
Torrance, Calif. C11	6.825	.....

SHEETS, Culvert Pure Iron

Ashland, Ky. A10	.....6.575
Fairfield, Ala. T2	.....6.325
Martins Ferry, O. W10	.....6.325

SHEETS, Galvannealed Steel

Canton, O. R2	.....5.825
Irvin, Pa. U5	.....5.825
Kokomo, Ind. (13) C16	.....5.925
Niles, O. N12	.....6.35

Based on 5c zinc**SHEETS, ZINCGRIP Steel**

Butler, Pa. A10	.....5.525
Middletown, O. A10	.....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler, Pa. A10	.....5.775
Middletown, O. A10	.....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28)	.....6.125
Niles, O. R2 (28)6.125
Weirton, W. Va. W65.975

SHEETS, ALUMINIZED

Butler, Pa. A108.625
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SHEETS, Enameling Iron

Ashland, Ky. (8) A105.175
Cleveland R25.175
Gary, Ind. U55.175
GraniteCity, Ill. G4	.....5.875
Ind. Harbor, Ind. I-2	.....5.175
Irvin, Pa. U5	.....5.175
Middletown, O. A10	.....5.175
Youngstown Y1	.....5.175

BLUED STOCK, 29 ga.

Yorkville, O. W10	.....7.20
Follansbee, W. Va. F4	.....7.30
Follansbee (23) F4	.....7.175

SHEETS, Long Terme Steel**(Commercial Quality)**

BeechBot'm, W. Va. W10	.....5.675
Gary, Ind. U5	.....5.675
Mansfield, O. E6	.....6.25
Middletown, O. A10	.....5.675
Niles, O. N126.00
Weirton, W. Va. W65.675

SHEETS, Long Terme, Ingot Iron

Middletown, O. A106.075
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SHEETS, Well Casing

Fontana, Calif. K16.20
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—STRIP—**STRIP, Hot-Rolled Carbon**

Ala. City, Ala. (27) R23.925
Alton, Ill. L14.20
Ashland, Ky. (8) A103.925
Atlanta A11	.....4.175
Bessemer, Ala. T2	.....3.925
Bridgeport, Conn. (10) S15	.....4.425
Buffalo (27) R2	.....3.925
Butler, Pa. (8) A10	.....3.925
Carnegie, Pa. S18	.....4.425
Conshohocken, Pa. A3	.....4.05
Detroit M1	.....4.40
Ecorse, Mich. G5	.....4.225
Fairfield, Ala. T2	.....3.925
Fontana, Calif. K1	.....4.70
Gary, Ind. U5	.....3.925
Houston, Tex. S5	.....4.425
Ind. Harbor, Ind. I-2, Y1	.....3.925
Johnstown, Pa. (25) B2	.....3.925
KansasCity, Mo. (9) S5	.....4.625
Lackw'n, N.Y. (32) B2	.....3.925
Los Angeles (25) B3	.....4.675
Milton, Pa. B6	.....4.35
Minneapolis, Colo. C10	.....5.025
New Britain (10) S15	.....4.425
N. Tonawanda, N.Y. B11	.....3.925
Pittsburgh, Calif. C11	.....4.675
Riverdale, Ill. A1	.....3.925
San Francisco S7	.....5.10
Seattle (25) B3	.....4.925
Seattle N14	.....4.925

Sharon, Pa. S3	.....4.225
So. Chicago, Ill. W14	.....3.925
So. San Francisco (25) B3	.....4.675
SparrowsPoint, Md. B2	.....3.925
Torrance, Calif. C11	.....4.675
Warren, O. R2	.....4.025
Weirton, W. Va. W6	.....4.025
Youngstown Y1, U5	.....3.925

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. (10) S15	6.45
Carnegie, Pa. S18	.....6.45
Fontana, Calif. K1	.....7.80
Gary, Ind. U5	.....6.40
Houston, Tex. S5	.....6.90
KansasCity, Mo. S5	.....7.10
Los Angeles B3	.....7.60
New Britain, Conn. (10) S15	6.45
Sharon, Pa. S3	.....6.45
So. Chicago W14	.....6.40
Youngstown U5	.....6.40

STRIP, Hot-Rolled**High-Strength Low-Alloy**

Bessemer, Ala. T2	.....5.85
Conshohocken, Pa. A3	.....6.20
Ecorse, Mich. G5	.....6.50
Fairfield, Ala. T2	.....6.85
Fontana, Calif. K1	.....7.05
Gary, Ind. U5	.....5.95
Ind. Harbor, Ind. I-2	.....5.95
Ind. Harbor, Ind. Y1	.....6.45
Lackawanna, N.Y. B2	.....6.00
Los Angeles (25) B3	.....6.40
Seattle (25) B3	.....6.65
Sharon, Pa. S3	.....5.95
So. San Francisco (25) B3	6.40
SparrowsPoint, Md. B2	.....6.00
Warren, O. R2	.....5.95
Weirton, W. Va. W6	.....6.30
Youngstown Y1	.....6.45
Youngstown U5	.....5.95

A1 Acme Steel Co.**A3 Alan Wood Steel Co.****A4 Allegheny Ludlum Steel****A5 Alloy Metal Wire Co.****A7 American Steel & Wire****A9 Angell Nail & Chaplet****A10 Armco Steel Corp.****A11 Atlantic Steel Co.****A13 American Cladmetals Co.****B1 Babcock & Wilcox Co.****B2 Bethlehem Steel Co.****B3 Beth. Pac. Coast Steel****B4 Blair Strip Steel Co.****B5 Bliss & Laughlin Inc.****B6 Bolardi Steel Corp.****B8 Baburn Alloy Steel****B11 Buffalo Bolt Co. Div.,****Buffalo-Eclipse Corp.****B12 Buffalo Steel Div.****H. K. Porter Co.****B14 A. M. Byers Co.****B15 J. Bishop & Co.****C1 Calstrip Steel Corp.****C2 Calumet Steel Div.,****Borg-Warner Corp.****C4 Carpenter Steel Co.****C5 Central Iron & Steel Div.****Barium Steel Corp.****C7 Cleve. Cold Rolling Mills****C8 Cold Metal Products Co.****C9 Colonial Steel Co.****C10 Colorado Fuel & Iron****C11 Columbia-Geneva Steel****C12 Columbia Steel & Shaft****C13 Columbia Tool Steel Co.****C14 Compressed Steel Shaft.****C16 Continental Steel Corp.****C17 Copperweld Steel Co.****C18 Crucible Steel Co.****C19 Cumberland Steel Co.****C20 Cuyahoga Steel & Wire****C22 Claymont Steel Products****Dept., Wickwire Spencer****Steel Division****C23 Charter Wire Products****C24 G. O. Carlson Inc.****D2 Detroit Steel Corp.****D3 Detroit Tube & Steel****D4 Disston & Sons, Henry****D6 Driver Harris Co.****D7 Dickson Weatherproof****Nail Co.****D8 Damascus Tube Co.****D9 Wilbur D. Driver Co.****E1 Eastern Gas & Fuel Assoc.****E2 Eastern Stainless Steel****E4 Electro Metallurgical Co.****E5 Elliott Bros. Steel Co.****E8 Empire Steel Corp.****F2 Firth Sterling Inc.****F3 Fitzsimmons Steel Corp.****F4 Follansbee Steel Corp.****F5 Franklin Steel Div.,****Borg-Warner Corp.****STRIP, Hot-Rolled Ingot Iron**

Ashland, Ky. (8) A104.175
Warren, O.4.525

STRIP, Cold-Rolled Carbon

STRIP, Cold-Rolled Carbon	
Anderson, Ind. G6	.....5.80
Bridgeprt. Conn. (10) S15	6.15
Butler, Pa. A10	.....5.45
Cleveland A7, J5	.....5.45
Dearborn, Mich. D3	.....6.05

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26- 0.40C	0.41- 0.60C	0.61- 0.80C	0.81- 1.05C	1.06- 1.35C
Berea, O. C7	6.15	8.00	8.60	10.55	12.85
Bridgeport, Conn. (10)	S15	6.15	8.00	8.60	10.55
Bristol, Conn. W1			8.90	10.85	
Carnegie, Pa. S18		8.00	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn Mich. D3	6.05	8.25	8.85		
Detroit D2	6.45	7.85	8.45	10.55	
Dover, O. G6	6.05	8.00	8.60	10.55	12.85
Franklin Park, Ill. T6	5.80	7.80	8.75	10.70	
Harrison, N.J. C18		8.90	10.85	13.15	
Mattapan, Mass. T6	6.30	7.95	8.90	10.85	13.15
New Britain, Conn. (10)	S15	6.15	8.00	8.60	10.55
New Castle, Pa. B4	5.80	8.00	8.60		
New Castle, Pa. E5	5.95	8.00	8.60	10.55	12.85
New Haven, Conn. D2	6.70	7.95	8.55	10.50	
New York W3		8.30	8.90	10.85	13.15
Pawtucket, R.I. N8:					
Cleveland, Pa. Base	6.65	8.00	8.60	10.55	12.85
Worcester, Mass., Base		7.95	8.90	10.85	13.15
Sharon, Pa. S3		8.00	8.60	10.55	12.85
Trenton, N.J. R5		8.30	8.90	10.85	13.15
Wallingford, Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren, O. T5	6.20	8.00	8.60	10.55	12.85
Weirton, W. Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester, Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester, Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8		8.00	8.60	10.55	12.85

Spring Steel (Tempered)					
Bristol, Conn. W1		12.50	15.00		
Franklin Park, Ill. T6		12.50	15.00	18.00	
Trenton, N.J. R5		12.50	15.00	18.00	
Harrison, N.J. C18		12.50	15.00	18.00	
New York W3		12.50	15.00	18.00	
Worcester, Mass. T6		12.50	15.00	18.00	
Youngstown C8		12.50	15.00	18.00	

SILICON STEEL

SHEETS, SILICON, H.R. or C.R. (22 Ga.)	Arma- ture	Elec- tric	Dyna- mo
COILS (cut lengths 1/2 lower)	Field	Motor	Motor
Beech Bottom W10 (cut lengths)		8.35	9.60 10.40
Brackenridge, Pa. A4		8.85	10.10 10.90
Granite City, Ill. G4 (cut lengths)		8.55	9.50
Indiana Harbor, Ind. I-2	8.05	8.35	8.85 (34)
Mansfield, O. E6 (cut lengths)	7.55	7.85	8.35 9.60 10.40
Newport, Ky. N9 (cut lengths)		7.85	8.35 9.60 10.40
Niles, O. N12 (cut lengths)	7.55	7.85	8.35
Vandergrift, Pa. U5		8.35	8.85 10.10 10.90
Warren, O. R2	8.05	8.35	8.85 10.10 10.90
Zanesville, O. A10		8.35	8.85 10.10 10.90

SHEETS, SILICON (22 Ga. Base)				
COILS (Cut Lengths 1/2 lower)	72	65	58	52
Beech Bottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge, Pa. A4	11.45			
Newport, Ky. N9 (cut lengths)	10.95			
Vandergrift, Pa. U5	11.45	12.00	12.70	13.50
Warren, O. R2	11.45			
Zanesville, O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler, Pa. A10 (C.R.)			16.05	16.55
Vandergrift, Pa. U5	14.00	14.55	15.55	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Albuquerque, Pa. J5	\$7.40	\$7.65	\$8.05
Fairfield, Ala. T2	7.50	7.75	8.15
Fairless, Pa. U5	7.50	7.75	8.15
Gary, Ind. U5	7.40	7.65	8.05
Granite City, Ill. G4	7.60	7.85	8.25
Indiana Harbor, Ind. I-2, Y1	7.40	7.65	8.05
Irvin, Pa. U5	7.40	7.65	8.05
Niles, O. R2	7.40		
Pittsburgh, Calif. C11	8.15	8.40	8.80
Sparrows Pt., Md. B2	7.50	7.75	8.15
Weirton, W. Va. W6	7.40	7.65	8.05
Yorkville, O. W10	7.40	7.65	8.05

TIN PLATE, American 1.5 1.50 Coke (Base Box) lb			
Albuquerque, Pa. J5 \$8.70	\$8.95		
Fairfield, Ala. T2	8.80	9.05	
Fairless, Pa. U5	8.80	9.05	
Gary, Ind. U5	8.70	8.95	
Ind. Har. I-2, Y1	8.70	8.95	
Irvin, Pa. U5	8.70	8.95	
Sparrows Pt., Md. B2	8.40	8.65	
Weirton, W. Va. W6	8.70	8.95	
Yorkville, O. W10	8.70	8.95	

BLACK PLATE (Base Box)			
Albuquerque, Pa. J5	\$8.50		
Fairfield, Ala. T2	8.60		
Fairless, Pa. U5	8.60		
Gary, Ind. U5	8.50		
Granite City, Ill. G4	8.70		
Ind. Harbor, Ind. I-2, Y1	8.50		
Irvin, Pa. U5	8.50		
Niles, O. R2	8.50		
Pittsburgh, Calif. C11	7.25		
Sparrows Pt., Md. B2	7.60		
Warren, O. R2	8.50		
Weirton, W. Va. W6	8.50		
Yorkville, O. W10	8.50		

HOLLOWWARE ENAMELING Black Plate (29 gauge)			
Follansbee, W. Va. F4	6.10		
Gary, Ind. U5	6.10		
Granite City, Ill. G4	6.30		
Ind. Harbor, Ind. Y1	6.10		
Irvin, Pa. U5	6.10		
Yorkville, O. W10	6.55		

MANUFACTURING TERNES (Special Coated)			
Fairfield, Ala. T2	\$7.85		
Gary, Ind. U5	7.75		
Irvin, Pa. U5	7.75		
Yorkville, O. W10	7.75		

MANUFACTURING TERNES, 8 lb (Commercial Quality)			
Gary, Ind. U5	\$9.75		
Yorkville, O. W10	9.75		

MANUFACTURING TERNES, 1T Coated, 6 lb			
Yorkville, O. W10	\$8.65		

ROOFING SHORT TERNES (8 lb Coated)			
Gary, Ind. U5	9.75		

—WIRE—

WIRE, Manufacturers Bright, Low Carbon			
Albuquerque City, Ala. R2	5.525		
Albuquerque, Pa. J5	5.525		
Alton, Ill. L1	5.75		
Atlanta A11	5.775		
Bartonsville, Ill. K4	5.625		
Buffalo W12	5.525		
Chicago W13	5.525		
Cleveland A7, C20	5.525		
Crawfordsville, Ind. M8	5.625		
Donora, Pa. A7	5.525		
Duluth, Minn. A7	5.525		
Fairfield, Ala. T2	5.525		
Fostoria, O. (24) S1	5.75		
Houston S5	5.925		
Johnstown, Pa. B2	5.525		
Joliet, Ill. A7	5.525		
Kansas City, Mo. S5	6.125		
Kokomo, Ind. C16	5.625		
Los Angeles B3	6.475		
Minneapolis, Colo. C10	5.775		
Monessen, Pa. P7	5.525		
Mo. Tonawanda B11	5.525		
Palmer, Mass. W12	5.525		
Pittsburgh, Calif. C11	6.475		
Portsmouth, O. P12	5.525		
Rankin, Pa. A7	5.525		
So. Chicago, Ill. R2	5.525		
So. San Francisco C10	6.475		
Sparrows Pt., Md. B2	5.525		
Sterling, Ill. (1) N15	5.525		
Struthers, O. Y1	5.525		
Torrance, Calif. C11	6.475		
Waukegan, Ill. A7	5.525		
Worcester, Mass. A7	5.525		

WIRE, MB Spring, High Carbon			
Albuquerque, Pa. J5	6.925		
Alton, Ill. L1	7.15		
Bartonsville, Ill. K4	7.025		
Buffalo W12	6.925		
Cleveland A7	6.925		
Donora, Pa. A7	6.925		
Duluth, Minn. A7	6.925		
Fostoria, O. S1	6.925		
Johnstown, Pa. B2	6.925		
Millbury, Mass. (12) N6	8.725		
Minneapolis, Colo. C10	7.175		
Monessen, Pa. P7	6.925		
Monessen, Pa. P16	6.95		
Muncie, Ind. I-7	7.125		
Palmer, Mass. W12	7.225		
Pittsburgh, Calif. C11	7.875		
Portsmouth, O. P12	6.925		
Roebing, N.J. R5	7.225		
So. Chicago, Ill. R2	6.925		
So. San Fran. C10	7.875		
Sparrows Pt., Md. B2	7.025		
Struthers, O. Y1	6.925		
Trenton, N.J. A7	7.225		
Waukegan, Ill. A7	6.925		
Worcester A7, J4	7.225		
Worcester T6, W12	7.225		

WIRE, Upholstery Spring			
Albuquerque, Pa. J5	6.625		
Alton, Ill. L1	6.85		
Buffalo W12	6.625		
Cleveland A7	6.625		
Donora, Pa. A7	6.625		
Duluth, Minn. A7	6.625		
Johnstown, Pa. B2	6.625		
Los Angeles B3	7.575		
Minneapolis, Colo. C10	6.875		
Monessen, Pa. P7, P16	6.925		
New Haven, Conn. A7	6.625		
Palmer, Mass. W12	6.925		
Pittsburgh, Calif. C11	7.575		
Portsmouth, O. P12	6.625		
Roebing, N.J. R5	6.925		
So. Chicago, Ill. R2	6.625		
So. San Francisco C10	7.575		
Sparrows Pt., Md. B2	6.725		
Torrance, Calif. C11	7.575		
Trenton, N.J. A7	6.925		
Waukegan, Ill. A7	6.625		
Worcester, Mass. A7	6.925		

WIRE, Fine & Weaving (8" Coils)			
Alton, Ill. L1	10.75		
Bartonsville, Ill. K4	10.65		
Buffalo W12	10.55		
Chicago W13	10.55		
Cleveland A7	10.55		
Crawfordsville, Ind. M8	10.55		
Fostoria, O. S1	10.55		
Kokomo, Ind. C16	10.55		
Monessen, Pa. P16	10.55		
Muncie, Ind. I-7	10.75		
Palmer, Mass. W12	10.85		
Roebing, N.J. R5	10.85		
So. San Francisco C10	10.90		
Waukegan, Ill. A7	10.55		
Worcester, Mass. A7, T6	10.85		

WIRE, Galv'd ACSR for Cores			
Bartonsville, Ill. K4	9.50		
Johnstown, Pa. B2	9.50		
Monessen, Pa. P16	9.50		
Muncie, Ind. I-7	9.70		
Roebing, N.J. R5	9.80		
Sparrows Pt., Md. B2	9.60		

ROPE WIRE	(A) WOVEN FENCE, 9-15/16 Ga. Co.
Alton, Ill. L1	9.45
Bartonsville, Ill. K4	9.35
Buffalo W12	9.35
Fostoria, O. S1	9.35
Johnstown, Pa. B2	9.35
Monessen, Pa. P7, P16	9.35
Muncie, Ind. I-7	9.55
Palmer, Mass. W12	9.65
Portsmouth, O. P12	9.35
Roebing, N.J. R5	9.65
Sparrows Pt. B2	9.45
Struthers, O. Y1	9.35
Worcester J4 T6	9.65
* A1 Plow and Mild Plow; add 0.25c for improved plow.	

WIRE, Tire Bead			
Alton, Ill. L1	12.75		
Bartonsville, Ill. K4	12.65		
Monessen, Pa. P16	12.00		
Roebing, N.J. R5	12.55		

WIRE, Cold-Rolled Flat			
Anderson, Ind. G6	7.45		
Buffalo W12	7.45		
Cleveland A7	7.45		
Crawfordsville, Ind. M8	7.55		
Dover, O. G6	7.45		
Fostoria, O. S1	7.45		
Kokomo, Ind. C16	7.55		
Franklin Park, Ill. T6	7.60		
Massillon, O. R8	7.45		
Monessen, Pa. P16	8.00		
Monessen, Pa. P7	7.45		
Pawtucket, R.I. (12) N8	7.75		
Trenton, N.J. R5	7.75		
Worcester A7, T6, W12	7.75		

Duluth, Minn. A7	6.675	7.075	NAILS, Stock
Fairfield T2	6.675	7.075	To dealers & mfrs. (7) C
Houston, Tex. S5	7.075	7.475	Alabama City, Ala. R2
Johnstown B2 (48)	6.675	7.225	Albuquerque, Pa. J5
Joliet, Ill. A7	6.675	7.075	Atlanta A11
Kansas City, Mo. S5	7.275	7.675	Bartonsville, Ill. (19) K4
Kokomo C16	6.775	7.175	Chicago, Ill. W13
Los Angeles B3	7.625		Cleveland A9
Minneapolis C10	6.925	7.325	Crawfordsville, Ind. M8
Monessen P7 (48)	6.675	7.225	Donora, Pa. A7
Palmer W12	6.975	7.375	Duluth, Minn. A7
Pitts., Calif. C11	7.625	8.025	Fairfield T2
Prtsmth (18) P12	6.575		Gaithersburg, Tex. D7
Rankin A7	6.675	7.075	Houston, Tex. S5
So. Chicago R2	6.675	6.925	Johnstown, Pa. B2
So. S. Frn. (48) C10	7.625	8.025	Joliet, Ill. A7
Spar'wspT. B2 (48)	6.775	7.325	Kansas City, Mo. S5
Sterl'g (11) (48) N15	6.675	7.225	Kokomo, Ind. C16
Struthers, O. Y1	6.675	7.175	Kansas, Colo. C10
Worcester A7	6.675		Monessen, Pa. P7
			Pittsburg, Calif. C11

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Revolving Ingots	Revolving Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F.		Sheets	C.R. Strip; Flat Wire
						Bars; Wire	Plates		
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	38.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	46.50	38.50
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L ....	.....	.....	36.75	.....	.....	42.75	45.25	54.25	49.00
306	19.50	25.50	.....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314 ....	.....	.....	.....	.....	.....	.....	69.00	74.50	.....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	68.50
316L ....	.....	.....	52.50	.....	.....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	58.25	66.75	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330 ....	.....	.....	58.00	.....	.....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403 ....	.....	.....	27.00	30.75	.....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	28.25	28.75	30.00	40.75	34.25
416 ....	.....	.....	24.50	28.25	.....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F ....	.....	.....	18.75	25.00	28.75	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	.....	.....	28.50	34.00	.....	35.00	38.50	49.25	52.75
442 ....	.....	.....	28.00	.....	.....	30.50	35.25	48.25	47.75
446 ....	.....	.....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501 ....	.....	.....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502 ....	.....	.....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co., Inc.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Elmhurst Steel Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; Page Steel & Wire Division, American Chain & Cable Co., Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co., Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates—Carbon Base		Sheets—Carbon Base		Copper Base
	10%	20%	20%	Both Sides	
302 .....	.....	31.00	.....	31.00	77.00
304	27.60	32.50-32.70	.....	32.50	77.00
310	36.50	41.00	.....	.....	144.00
316	32.60	37.70-42.75	.....	42.75	.....
318	37.00	42.20	.....	.....	.....
321	29.30	34.40-37.00	.....	37.00	111.00
347	30.40	35.50-40.50	.....	40.50	130.00
406	23.40	.....	.....	.....	.....
410	22.90	30.10	.....	.....	.....
430	41.23	54.18	.....	.....	165.00
Inconel	37.50	50.90	.....	.....	.....
Nickel	38.90	51.80	.....	.....	.....
Copper* .....	.....	.....	.....	46.00	.....

* Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont Del. C2; Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	\$ per lb	Grade	\$ per lb
Regular Carbon .. 0.25-2.85	5% Cr Hot Work.... 0.3	.....
Extra Carbon .. 0.33-0.40	W-Cr Hot Work 0.4	.....
Special Carbon .. 0.35-3.80	V-Cr Hot Work 0.4	.....
Oil Hardening .. 0.370-3.9	Hi-Carbon-Cr. .. 0.665-7.7	.....

Grade by Analysis (%)					
W	Cr	V	Co	Mo	\$ per lb
20.25	4.25	1.6	12.25	.....	4.05
18.25	4.25	1	4.75	.....	2.34
18	4	2	9	.....	2.565-2.89
18	4	2	.....	.....	1.82
18	4	1	.....	.....	1.580-1.62
13.5	4	3	.....	.....	1.87
6.4	4.5	1.9	.....	5	1.30
6	4	3	.....	8	1.30
2	1.4	1.2	.....	.....	0.49
1.5	4	1	.....	8.5	0.89

Tool steel producers include: A4, A8, B2, B8, C4, C8, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	\$58.00	\$58.50	\$59.00	\$59.50
New York, del.	.....	61.25	62.78	.....
Newark, del.	61.02	61.52	62.02	62.52
Philadelphia, del.	60.75	61.25	61.75	62.25
Birmingham District				
Alabama City, Ala. R2	52.38	52.88	.....	.....
Birmingham R2	52.38	52.88	.....	.....
Birmingham U6	52.38	52.88	.....	.....
Woodward, Ala. W15	52.38	52.88	.....	.....
Cincinnati, del.	.....	60.43	.....	.....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	.....
Tonawanda, N.Y. W12	56.00	56.50	57.00	.....
No. Tonawanda, N.Y. T9	.....	56.50	57.00	.....
Boston, del.	66.65	67.15	67.65	.....
Rochester, N.Y., del.	59.02	59.52	60.02	.....
Syracuse, N.Y., del.	60.12	60.62	61.12	.....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00	.....	56.50	.....
Indiana Harbor, Ind. I-2	56.00	.....	56.50	.....
So. Chicago III, W14, Y1	56.00	56.50	56.50	.....
So. Chicago III, U5	56.00	.....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon, Mich., del.	.....	62.80	62.80	.....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	.....
Akron, O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	.....	.....	57.00
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	.....
Pitts., N.&S. sides, Ambridge,	.....	.....	.....	.....
Aliquippa, del.	57.37	57.87	57.87	.....
McKees Rocks, del.	57.04	57.54	57.54	.....
Lawrenceville, Homestead,	.....	.....	.....	.....
Wilmerding, Monaca, del.	57.66	58.16	58.16	.....
Verona, Trafford, del.	58.19	58.69	58.69	.....
Brackenridge, del.	58.45	58.95	58.95	.....
Bessemer, Pa. U5	56.00	.....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa.	56.00	.....	.....	57.00
McKeesport, Pa. N3	56.00	.....	.....	57.00
Midland, Pa. C18	56.00	.....	.....	.....
Monessen, Pa. P7	56.00	.....	.....	.....
Youngstown District				
Hubbard, O. Y1	.....	56.50	.....	.....
Youngstown Y1	.....	56.50	57.00	.....
Youngstown U5	56.00	.....	57.00	.....
Mansfield, O., del.	60.90	.....	61.40	61.90

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	.....	63.25	63.75	.....
Fontana, Calif. K1	62.00	62.50	.....	.....
Geneva, Utah C11	57.50	58.00	.....	.....
Granite City, Ill. G4	57.90	58.40	58.90	.....
Ironton, Utah C11	56.00	56.50	.....	.....
LoneStar, Texas L6	52.00	52.50*	52.50	max F
Minneapolis, Colo. C10	58.00	59.00	59.00	.....
Rockwood, Tenn. T3	58.00	58.50	58.50	.....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	.....	.....
Troy, N.Y. R2	58.00	58.50	59.00	.....

* Low phos. southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVER PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add \$1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	\$67.00
Buffalo H1	68.20

ELECTRIC FURNACE SILVER PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.5% Si to 18%; \$1.45 for each 0.5% Mn over 1%; \$2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	\$91.00
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	95.50
Keokuk, OH & Fdry, 12 1/2 lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry, freight allowed K2	95.50
LOW PHOSPHORUS PIG IRON, Gross Ton	
Cleveland, Intermediate, A7	\$61.00
Rockwood, Tenn. T3	68.50
Steelton, Pa. B2	64.00
Philadelphia, delivered	67.50
Troy, N.Y. R2	64.00

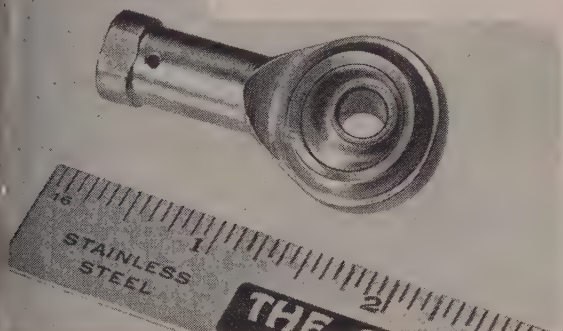
FACTS

...About a Straight Chrome Stainless Steel That Shows Unusual Promise for Your Applications...

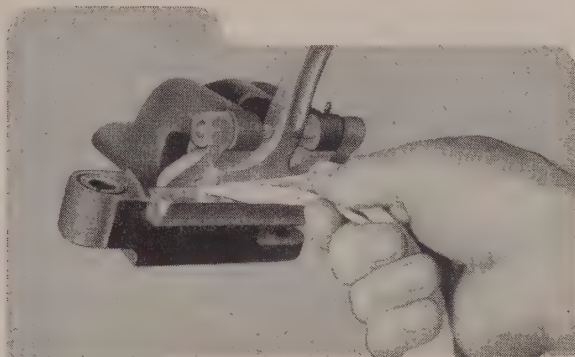
If your products or components call for the properties of a stainless steel, here is a stainless that shows unusual promise for many applications. And this steel (Carpenter No. 3, Type 443) is particularly important today for applications requiring an improved straight chrome stainless to replace the 18-8's restricted by Government regulations. Carpenter Stainless No. 3 gives you excellent corrosion resistance, high resistance to scaling,

and a low annealing temperature (500°F lower than type 304). Moreover, No. 3 provides machinability comparable to SAE 3145, 3250 or 4650. For more information on No. 3—its mechanical properties, relative workability, corrosion resistance, recommended uses, etc.—drop us a line on your Company letterhead for the new descriptive folder on Carpenter No. 3.

Typical user reports on Carpenter Stainless No. 3



This rod end bearing for military aircraft must have heat resistance, ability to resist salt corrosion, good machinability and good cold forging qualities. Carpenter No. 3 has met all these requirements and is giving an excellent account of itself both as to corrosion and heat resistance at operating temperatures up to 1000°F. Moreover, No. 3 is not subject to intergranular corrosion at this temperature.



These jaw inserts for tenter clips grip and stretch nylon cloth as it rolls through finishing stages. Inserts must be spotless and must resist corrosive action of the dyes because a slight surface defect could break the threads. In addition to good corrosion resistance, No. 3 gave the inserts high wear resistance for long service—including resistance to abrasion from talc and china clay used in other textiles processed.

A word about availability...

Carpenter Stainless No. 3 (Type 443) is available from Reading Warehouse Stocks, hot rolled annealed in sizes $\frac{3}{8}$ " to 2 $\frac{3}{4}$ " round. Other standard bar sizes and finishes,

also cold rolled strip, are manufactured to order in minimum quantities of 500 pounds per size. Mill shipments are currently 60 to 120 days from receipt of order and neither priorities nor allotments are required.

CARPENTER SPECIALTY STEELS

CARPENTER MATCHED TOOL & DIE STEELS, STAINLESS STEELS, PLASTIC MOLD STEELS, INDUSTRIAL & ELECTRICAL ALLOY STEELS, HIGH SPEED TOOL BITS, TOOL STEEL DRILL RODS & STAINLESS TUBING & FINE WIRE

Carpenter

Stainless Steel

pioneers in improved specialty steels

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Export Department: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS		H.R. Alloy 4140††	Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡			Carbon	Floor
Baltimore	6.20	7.64	7.81	7.00	...	6.56	8.17*	12.04	6.98	6.85	7.98
Birmingham ...	6.10	7.00	8.00‡	6.30	...	6.15	8.90	...	6.35	6.35	8.65
Boston	6.89	7.83	9.23	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	9.01	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	...	7.10	7.10	8.37
Chicago	6.18	7.12	8.05	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.47	6.72	...	6.59	7.66	12.17	6.93	6.85	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.34	6.71	7.36	6.58	7.60	11.92	6.93	6.85	7.80
Houston	7.15	7.85	9.32	7.45	...	7.45	...	...	7.35	7.20	8.55
Jersey City, N.J.	6.54	7.45	8.72	6.82	...	6.75	8.43*	11.84	6.50	6.67	8.01
Los Angeles ...	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.22	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.40	6.77	...	6.63	7.65	...	6.81	6.68	...
New York	6.54	7.45	8.72	6.82	...	6.75	8.43*	11.84	6.50	6.67	8.01
Newark, N. J. .	6.78	7.75	9.02	7.16	...	7.06	8.43*	...	6.90	6.99	8.30
Norfolk, Va. .	6.90	...	...	7.20	...	7.20	8.50	...	7.20	7.15	7.85
Philadelphia ...	6.53	7.55	8.35	7.02	8.80	6.87	8.19*	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg..	7.90	9.30	10.00	7.90	...	7.60	10.65	...	7.50	7.55	9.40
Richmond, Va. .	6.50	7.45	8.00	7.10	...	7.05	7.95	...	7.10	6.85	8.10
St. Louis	6.48	7.42	8.35	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.71	7.08	...	6.94	8.06	...	7.12	6.99	8.12
San Francisco..	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	8.70	10.10	8.02	...	7.58	10.13	13.50	7.50	7.59	9.40
Spokane	8.15	9.25†	10.10	8.50	...	7.60	11.00‡	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	...	7.49	7.38	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** 1/4" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; ‡—500 to 9999 lb; §—1000 to 1999 lb; ¶—1000 lb and over; †—1500 lb to 3499; ‡—under 1/4 in.

Distributors Exert More Selling Pressure

Warehouses report improvement in sales since Labor Day and anticipate brisk business in fourth quarter, but consumers are ordering more conservatively

Cleveland—District distributors report some improvement in order volume since Labor Day and anticipate brisk business going into fourth quarter though pressure from consumers is off noticeably and salesmen are again finding it necessary to be more than order-takers. Some warehousemen think that the tendency of consumers to order needs more conservatively, noted increasingly at the mill level, will serve to direct a substantial volume of business to them that might otherwise go direct to the mills.

Warehouse receipts from the mills continue to improve. Currently, overall stocks are estimated at about 90 per cent of the level of October, 1949.

Chicago—Warehouses still experience a good demand for steel although business is not as strong as it was two months ago. Mill shipments to distributors have improved but some products still are inadequate in supply. Notably in short supply are wide flange beams and other heavy structurals.

Boston—Warehouse sales are up this month, but volume is not back to the level of the first half. With inventories back to 80 per cent on the average, distributors are order-

ing to specification except for a few tight products.

New York—With more consumers aiming at inventory adjustment warehouse order volume is off. While there has been an improvement in demand this month, pressure on the distributors for steel is definitely not as heavy as it was earlier this year.

Philadelphia—Distributors' greatest buying interest is in fast moving products and in filling holes in slow-moving sizes. They expect September business to be above that of August and new orders to keep coming in steadily, if cautiously, until mid-December and the yearend inventory pause. Extra reliance on warehouses is seen possible because of current business uneasiness and a desire not to tie up capital in forward ordering from mills.

St. Louis—Steel warehouse business is perking up a bit over July and August, probably because the vacation season is over. Stocks generally are up to an estimated 75 per cent of normal, with varieties and sizes fairly well balanced.

Better warehouse receipts from mills reflect the softening steel situation. At least two major ware-

houses here have added salesmen for the more aggressive merchandising demanded by competition. Some unheralded price trimming is underway on sheets and some other items.

Pittsburgh—On all but the tightest items, warehouses are improving inventories while demand declines. "We're a long way from having balanced inventory, but we're approaching it," a leading warehouseman reports.

No balance is in sight for structural and bar shapes and plates. If freer supply are cold-finished bars, stainless steel and alloy bars.

Birmingham—Warehouse shipments here remain brisk even though demand has tapered off generally some specifications. This is generally attributed to the fact shipments to warehouses are still on the short side.

Los Angeles—Distributors' sales are steady at the August level. Total steel inventories, approaching 80 per cent of normal, into better balance, warehouses are generally placing orders for fourth quarter steel at rates in excess of sales.

San Francisco—Volume is down a bit and there is considerably more competition, but warehouses as a whole, are not complaining. They still are enjoying a lively business. While physical volume of inventories has crept up no warehouse in the territory has a full range of stocks.

Seattle—While the potential market is large, warehouse buying continues to drag, consumer tendency being to use current inventories.

Order Load On Sheet Mills Heavy

Strong demand continues to be encountered though consumer buying pressure is easing. Freer supply indicated in fourth quarter with urgency to order less pressing

Sheet and Strip Prices, Page 204 & 205

Boston—For the most part, order cutbacks on flat-rolled carbon stock have been confined to tonnage placed originally for automobile assembly. Some stainless is included. Stamping shops supplying components are slower. This has opened capacity for more fourth quarter tonnage for other users.

Shipments are heavy and inventories with most sheet and narrow strip consumers will be in balance by end of fourth quarter. A possible exception is silicon strip.

New York—More hot-rolled sheet is being offered in this district, and with fabricators guarding against overbooking, pressure on sellers is diminishing correspondingly.

Philadelphia — Effective Sept. 11, Alan Wood Steel Co., Conshohocken, Pa., reduced hot-rolled carbon sheet and strip to a base of \$4.05, Conshohocken.

Less hectic days are in store for sheet buyers. Extra tonnage in all grades will be forthcoming in the last three months of the year. More hot-rolled sheets will be turned out at the Fairless Works and cold-rolled sheets will start coming through.

Pittsburgh — Producers still can't match brisk demand for sheets in this area, although they are catching up slowly. Opinion places supply-demand balance in late fourth quarter.

Fabricators may soon get tonnage shipments from U. S. Steel's Fairless Works as well as quicker delivery from this area's mills.

Cleveland—Sheetmakers note some easing in demand pressure but order volume continues heavy and expectations are fourth quarter order books, at least so far as the larger mills are concerned, will be filled without difficulty. Some of the premium-price and less favorably situated producers are feeling contraction in buying more severely than the larger makers.

Chicago — Demand for hot-rolled carbon sheets continues strong in this area, perhaps more so than in some other districts, for this is a deficit area of steel capacity.

While there have been some order cancellations, they have been small and insignificant. Over-all demand still exceeds supply. Demand for galvanized sheets is good, partly because of the government's grain bin pro-

gram. Also in good demand are enameling sheets.

Conversion Steel . . .

Chicago—Rolling of steel on conversion contracts is expected to be completed by the end of October. For some weeks no new contracts for conversion rolling have been made. The end of this business came with the general decline in demand for steel.

Steel Bars . . .

Bar Prices, Page 204

Chicago—Demand for carbon bars is easing and demand for alloy bars is soft. The easing on carbon bars stems largely from reduced demands from the farm implement makers and from expectations of cuts in the government's projectile program. The easing extends into the larger sizes, which, until recently, have been in extremely strong demand. Smaller sizes of hot-rolled carbon bars have not been as hard to get as the larger sizes. Supply of cold-finished car-

bon bars, except in the large sizes, has been plentiful.

Helping take some of the pressure off bars is Wisconsin Steel Co., affiliate of International Harvester Co. Now that the farm implement business is slow International Harvester's demand on Wisconsin Steel is reduced, and the latter is making some of its bar capacity available on a selective basis to other consumers.

Cleveland — Demand pressure is easing gradually in the bar market. Producers will enter fourth quarter with substantial order backlogs but new business has not been developing in the former volume and tonnage will be more freely available in the closing three months of the year than has been the case for a long time past.

In general, consumption reportedly is holding at a high level but consumer ordering increasingly is reverting to former normal buying practice. Uncertainty with respect to the trend of business over coming months is inducing more caution in buying for stock and with the outlook for supply availability improving steadily the urgency for consumers to cover ahead is less and less in evidence.

Boston—Orders for cold-finished carbon bars for November and beyond are slower, notably smaller sizes. Alloys schedules for that month are filling. Cancellations on hot-rolled carbon bars have opened up some tonnage for fourth quarter. Converters are placing orders cautiously as stocks of cold-finished build up in more smaller sizes.

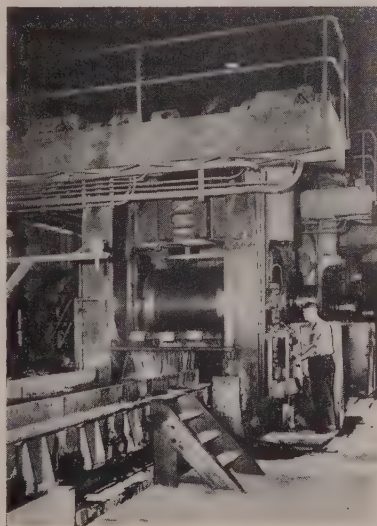
New York—Definite easing now is showing up in hot-rolled and cold-finished bars. Demand fall-off is most noticeable in small rounds from $\frac{3}{8}$ to 2 inches.

Belgian reinforcing bars are offered at \$87 per metric ton, f.o.b. Antwerp, with sales reported as low as \$78. Freight rate to New York is \$12 per metric ton. Carbon bars are quoted at \$87 with discounts up to \$4; shapes are listed at \$93 with discounts of \$3.

Philadelphia — By the middle of November, barmakers think they will have enough steel to make deliveries when people want them.

Dearth of orders for small cold-finished bars is noticeable. Alloy bars are no supply problem at all. "Bar suppliers may preach shortage but they take care of all our orders," says one big user.

Early October deliveries on hot bars under 2-inches is possible and quotas are a thing of the past. Large bars call for negotiation, but extra tonnages can be had. The fuze program has hit the stretchout and the



Hot Strip Mill Hums

This four-stand hot finishing train (delivery end) at Empire Steel Corp., Mansfield, O., is part of a complete hot-strip mill engineered by E. W. Bliss Co., Toledo, O. Thirty units were involved, ranging from bloomer and edger stands and four-high mills to run-out tables, shears and plate pilers

shell program is expected to follow suit soon, easing the market further.

Pittsburgh—Demand remains low for alloy bars and cold-finished carbon bars in small sizes. Bars 1½-inches and larger are in short supply. Smaller-size bars are easy.

Semifinished Steel . . .

Semifinished Prices, Page 204

Chicago—The district steelmaking rate for the week ended Sept. 19 rose to 101 per cent of capacity, one point over the preceding week's revised rate.

August Steel Output Sets Record

Month is seventh this year in which steel production exceeded 9 million tons. Operations, averaging 94.1 per cent, top July rate. Total 8 months' output greatest ever reported

New York—August was the seventh month this year in which steel production exceeded 9 million tons, reports the American Iron & Steel Institute. Actual output for the month was 9,401,000 tons of ingots and steel for castings, a production record for August and bettering the July total of 9,275,673 tons by 125,327 net tons. In March production exceeded 10 million tons for the first time in history.

Ingot operations averaged 94.1 per cent in August, an increase compared with 93.1 per cent in July. In 1952, when steel capacity was lower than this year, the furnaces would have had to operate at 102.2 per cent of 1952 capacity in order to produce as much steel as was turned out in August this year.

During the first eight months this

Principal reasons for the slight rise are increases by Youngstown Sheet & Tube Co. and Wisconsin Steel Co. The latter company, an affiliate of International Harvester, was scheduled to operate at 71.2 per cent of capacity compared with a low mark of 59.8 per cent for the week ended Sept. 12.

Most of Wisconsin Steel's output goes into International Harvester's implements. Before the drop in the implement business was felt fully, Wisconsin Steel operated as high as 115 per cent of capacity early this year.

year production totaled 76,622,609 net tons, the largest amount ever produced in a comparable period. Output in the first eight months last year, when operations were severely curtailed by the steel strike, totaled only 55.1 million tons. In the first eight months of 1951 production amounted to about 69.7 million ingot tons.

Steel production in the 12 months ended Aug. 31 this year amounted to 114.6 million tons, according to the Institute. This was far greater tonnage than ever produced in any previous 12 months. It was about 2½ times greater than Russia's expected production this year, and compares with 107 million tons produced in the 12 months starting Apr. 1, 1951. The highest production in a calendar year was 105.2 million tons in 1951.

Of the six ingot producers in this district, all but Wisconsin Steel and Inland Steel are operating above 100 per cent of capacity. Inland was scheduled for 97.8 per cent in the week ended Sept. 19.

Buffalo—Efforts to settle the wild-cat strike of coke oven workers at Bethlehem's Lackawanna plant were futile last week and the entire plant was inoperative with 32 open hearths and 7 blast furnaces down completely. Ingot operations in the district are estimated at 26 per cent of capacity which compares with 31.5 last week.

Los Angeles—Wild-cat strike for 48 hours at Kaiser Steel Corp., Fontana Works, closed down 9 open-hearth and 3 blast furnaces, and cost 11,000 tons of ingots.

Plates . . .

Plate Prices, Page 204

Philadelphia—Central Iron & Steel Co., Harrisburg, Pa., reduced plate prices from \$6.95 to \$4.95, effective Sept. 11. The new base still leaves a premium of \$8 per ton, comparing with a base price of \$4.55 Claymont, and Conshohocken, Pa., \$4.35 Coatesville, and \$4.10 at Sparrows Point and Pittsburgh.

Higher priced midwest producers are expected to be less of a market factor here than ever.

The plate market shows soft spots, but the general tone continues good. Demand still exceeds supply as a rule.

Boston—Cutbacks in plates are limited mostly to military requirements, including low alloy high tensile grades. Heavy and wide carbon plates are in good demand with some pressure for delivery, but narrow stock, 6 to 36-inches, is available in larger volume for November delivery.

New York—Mills are booked up through rest of the year on light wide plates. There's room in fourth quarter books for some narrow sizes. Heavy plates are in a position somewhere between the two from a demand-supply standpoint. Tank fabricators can't get enough light wide plates because strip mills are getting out of the plate market.

Pittsburgh—The few producers of heavy plates continue to enjoy an enviable position. All types are in short supply. Light plates show signs of loosening.

Chicago—Demand for carbon steel plates exceeds supply. One producer thinks it may have an order carry over on wide plates into the first quarter of 1954. Among consumer needing more plates are tank and structural fabricators. Even builders of railroad freight cars exert a good demand for plates.

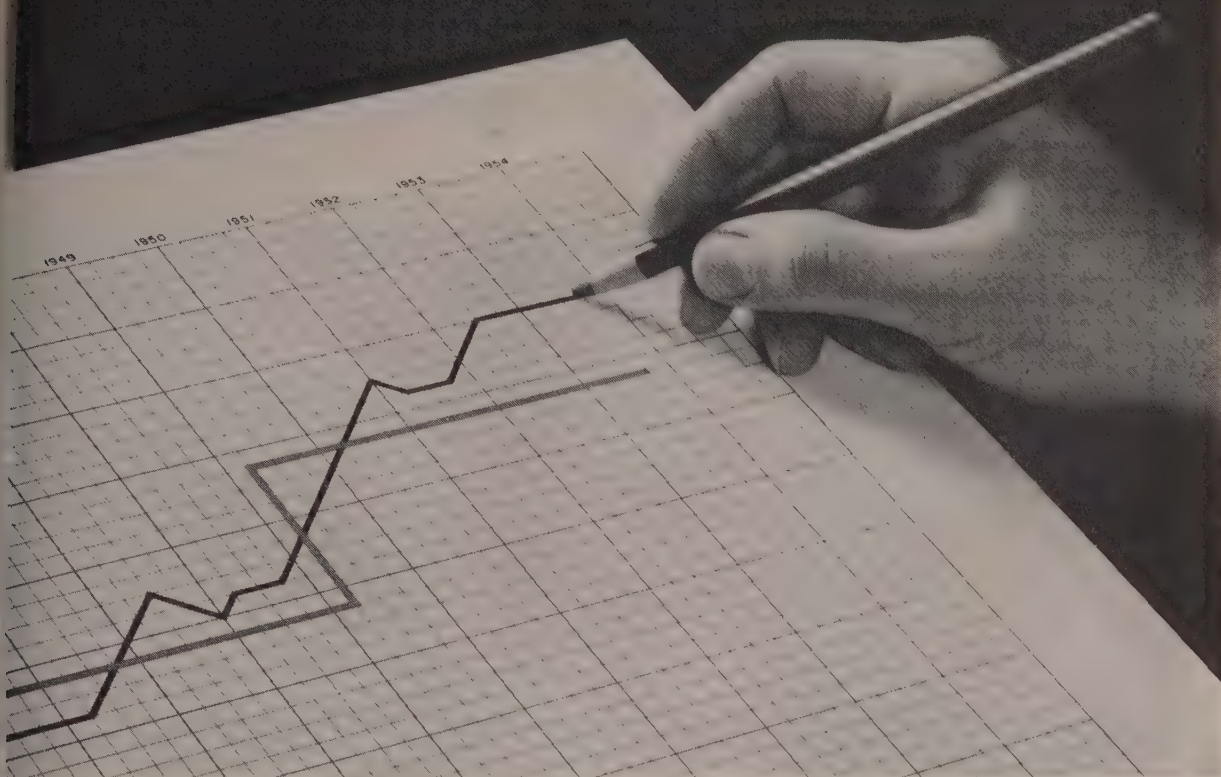
Birmingham—Plates remain in

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated	No. of
	Net tons	% of capac.	Net tons	% of capac.	Net tons	% of capac.	Net tons	% of capac.	weekly production	weeks in mos.
1953										
January	8,441,679	101.4	350,000	88.9	706,083	81.2	9,897,962	99.1	2,234,303	4.43
February	7,939,299	100.8	329,389	92.6	664,091	84.6	8,932,779	99.1	2,233,195	4.00
March	9,050,773	103.7	354,710	90.0	762,615	87.7	10,168,098	101.8	2,295,282	4.43
1st Qtr.	25,831,751	102.0	1,034,299	90.4	2,132,789	84.5	28,998,839	100.0	2,254,964	12.86
April	8,493,909	100.5	334,605	87.7	717,024	85.2	9,545,538	98.7	2,225,067	4.29
May	8,925,163	102.3	354,577	90.0	717,340	82.5	9,997,080	100.1	2,256,677	4.43
June	8,394,502	99.4	332,060	87.0	677,917	80.5	9,404,479	97.2	2,192,186	4.29
2nd Qtr.	25,813,574	100.8	1,021,242	88.3	2,112,281	82.7	28,947,097	98.7	2,224,988	13.01
1st 6 Mo.	51,645,325	101.4	2,055,541	89.3	4,245,070	83.6	57,945,936	99.4	2,239,889	25.87
*July	8,316,342	95.5	324,068	82.4	635,263	73.2	9,275,673	93.1	2,098,560	4.42
†August	8,447,000	96.8	310,000	78.7	644,000	74.1	9,401,000	94.1	2,122,000	4.43
1952										
1st Qtr.	24,207,329	102.5	1,168,871	87.4	1,824,524	89.1	27,200,724	100.7	2,092,363	13.00
April	7,101,199	91.1	323,006	73.2	567,935	84.1	7,992,140	89.7	1,862,970	4.29
May	7,291,865	90.6	318,642	69.9	595,135	85.3	8,205,642	89.2	1,852,289	4.43
June	1,446,927	18.6	22,862	5.2	170,000	25.2	1,639,789	18.4	382,235	4.29
2nd Qtr.	15,839,991	67.0	664,510	49.6	1,333,070	65.1	17,837,571	66.0	1,371,066	13.01
1st 6 Mo.	40,047,320	84.8	1,833,381	68.5	3,157,594	77.1	46,038,295	83.4	1,731,576	26.01
July	1,347,587	16.8	2,000	0.4	277,859	39.9	1,627,446	17.7	368,200	4.42
August	7,599,888	94.4	309,361	67.8	490,478	84.6	8,499,725	92.4	1,918,674	4.43

Note—The percentages of capacity in 1953 are calculated on weekly capacities of 1,969,275 net tons open-hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953, as follows: Open-hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons. The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,928 net tons bessemer and 137,477 net tons electric ingots and steel for castings, total 2,057,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons.

*Revised.

†Preliminary figures, subject to revision.



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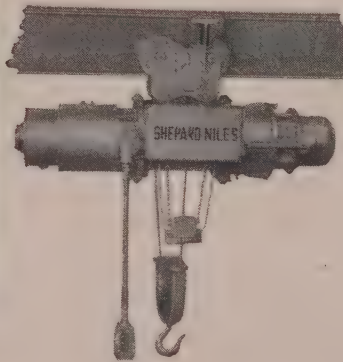
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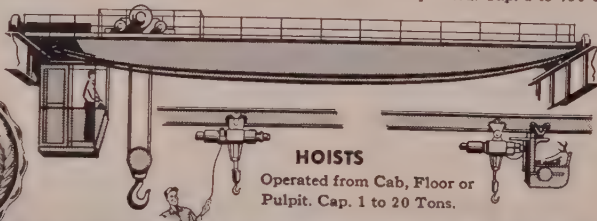
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strong demand in this section even though car building backlogs have dwindled considerably and the Bessemer plant is looking for additional business.

Seattle—Small plate fabricating shops are having difficulty competing for business because of the continued shortage of plates. No improvement in supply conditions is expected until the first quarter of next year. Several sizable awards are pending, including 1750 tons for a Navy tank installation at Manchester, Wash., and 2000 tons or more for fuel tank jobs at defense centers in Washington state and Alaska.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 204

Seattle—The rolling mills in this area continue to operate at peak capacity and prospects for the remainder of 1953 are considered favorable. Small tonnages total considerable volume and backlogs are about static. Road projects in the Pacific Northwest and Alaska construction are still calling for sizable shipments of reinforcing bars. Bethlehem Pacific Coast Steel Corp. booked 1000 tons of reinforcing for the Chandler pumping plant, Columbia Basin project.

Tubular Goods . . .

Tubular Goods Prices, Page 207

Pittsburgh — Seamless tubing demand has slackened noticeably from early third quarter. Adjustments in buyers' schedules and inventory control is reflected in declining orders. Distributors are more selective, rounding out their holdings and ordering less of the freer items.

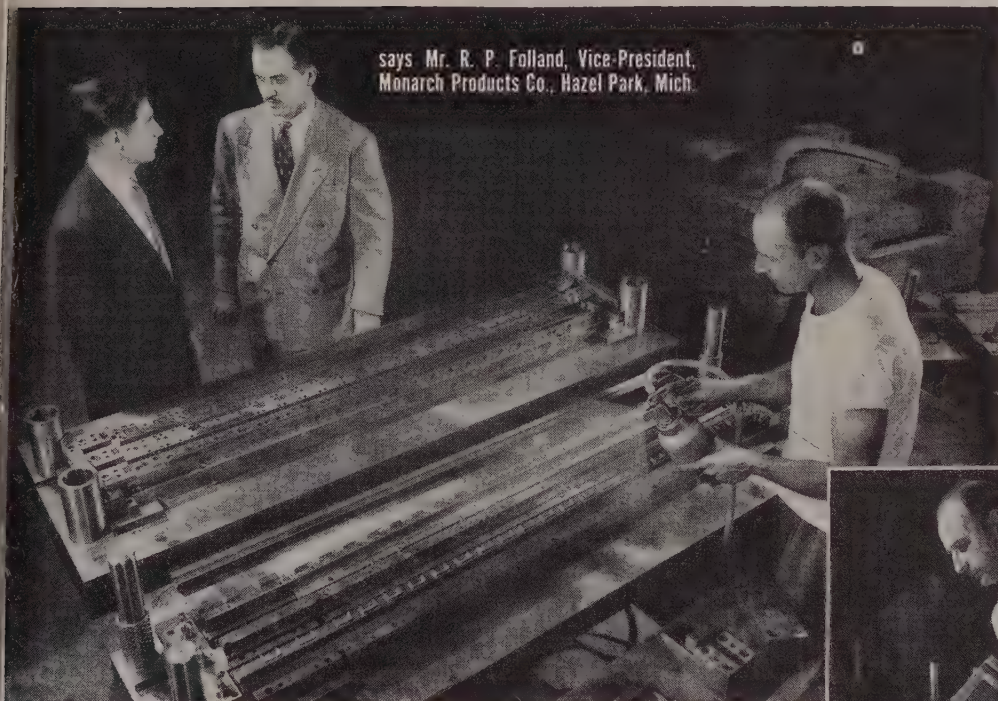
Boston—Light wall electric tubing prices are soft. Surplus carbon volume produced by district consumers beyond their own requirements are offered below listed prices and several outside this district are meeting them on a delivered basis.

New York — Reflecting reduction in prices of zinc, the United States Steel Export Co., subsidiary of U. S. Steel Corp., announced the following new export base prices with freight included to New York, Philadelphia and Baltimore: American standard pipe; T & C, galvanized butt weld 2½ and 3-in., minus 14.06 per cent discount; galvanized seamless 2-in. plus 5.69 per cent; 2½-in., plus 3.4 per cent; 3-in., plus 0.94 per cent; 3½ and 4-in., minus 0.56 per cent; 5-in., plus 0.19 per cent; 6-in., minus 2.31 per cent.

Seattle—Cast iron pipe demand is seasonally slow but sales agencies now able to give 30 to 45-day deliveries, are in an improved competitive position.

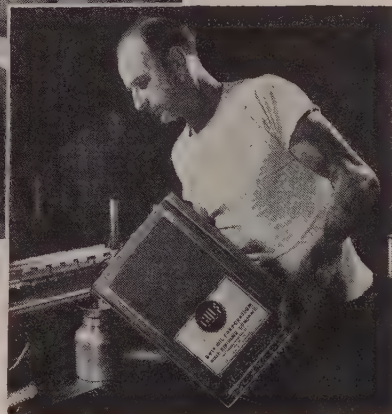
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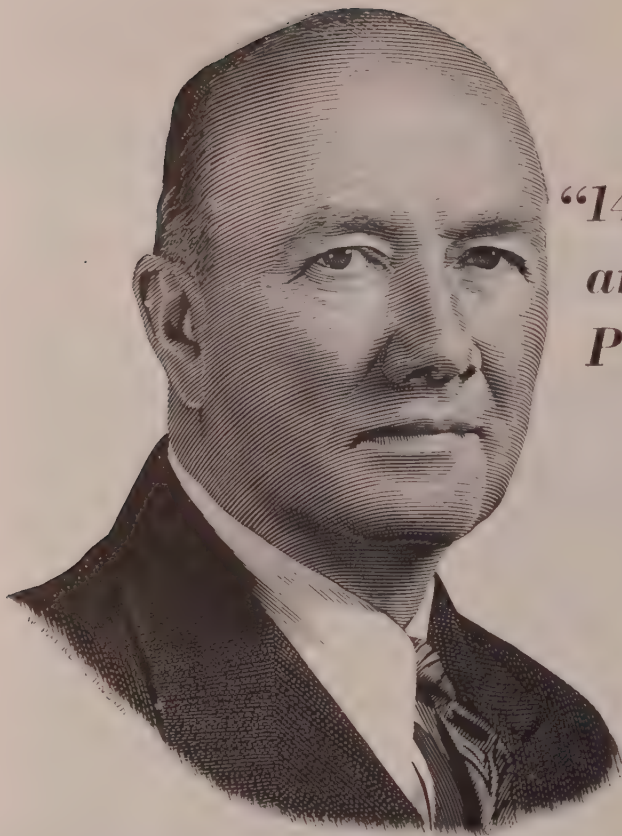
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STEEL

Wire . . .

Wire Prices, Page 206

Chicago — Slight improvement in demand for merchant wire products, particularly barbed wire and nails, is noted in this area. For some time, demand for merchant wire products has been slack. Remaining soft are poultry netting, baling wire and woven wire fence. Demand for manufacturers wire is fair, except from agricultural implement makers whose business is slow.

Boston — Wire mill schedules for October are filled to capacity on relatively few finished products. Consumers are not adhering to lead-time and most are trying to get inventories down to a 30-day basis. This includes cold-heading and spring wire.

Tin Plate . . .

Tin Plate Prices, Page 206

New York — United States Steel Export Co., subsidiary of U. S. Steel Corp., recently announced the following export base prices on tin mill products, freight included to New York, Philadelphia and Baltimore: coke tin plate, 1.25 pound coating, \$9.58 per base box; electrolytic tin plate, .25 pound coating, \$8.26, base box; coated manufacturing terne plate, \$8.60, base box; black plate, \$7.38, base box.

Competition in tin plate from abroad, particularly British mills, is seen as a reason for snipping export prices on coated manufacturing terne plate, black plate and electrolytic tin plate 50 cents, and coke tin plate 51 cents per base box.

Pittsburgh — Producers who enjoyed the high summer rate of tin plate output now predict a fourth quarter drop as much as 40 per cent below third quarter operations.

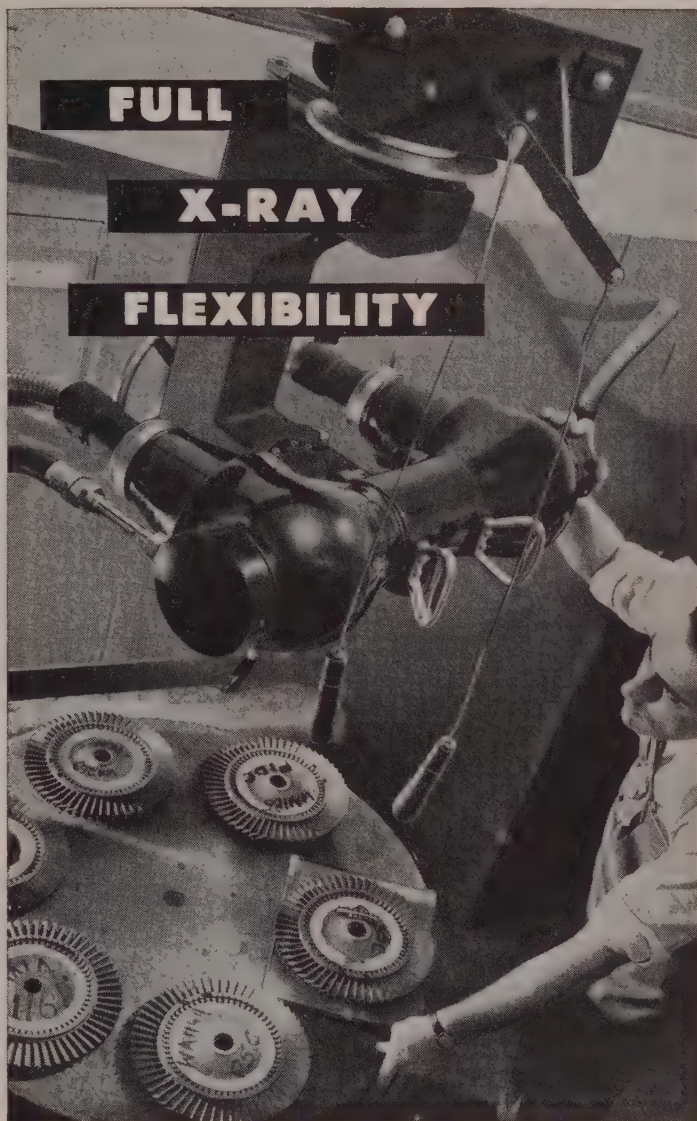
Structural Shapes . . .

Structural Shape Prices, Page 204

Philadelphia — Structural fabricating shops report mill shipments have improved no more than 10 per cent in the past six months. Recently, standard shapes and reinforcing bars have been coming in well, as have 42 and 48-inch mill sizes of wide flange beams. Inquiries are slower and deliveries seem to be more important to customers.

Business remains good but competition is sharpening on fabrication and erection, as exemplified by bidding on 730 tons for a John Wanamaker store in suburban Winwood.

Boston — Except for a shortage of wide-flanged material, fabricating structural shops are better off on plain shapes. More wide-flanged



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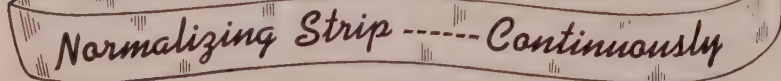
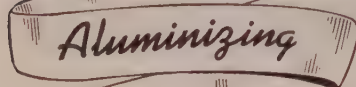
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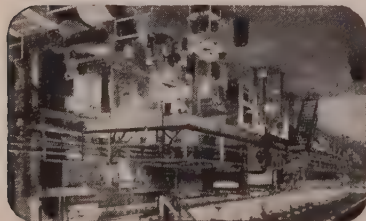
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beams are under allocation with producers in some cases limiting rolling of light weight sections on heavier mills.

New York—On fabricated structural work, 500 tons and under, competition is sharper with price a factor in placement of contracts. Prices on larger tonnages are firmer. While the supply of plates for continuous girder projects has improved, wide-flange beams are allocated with more mill tonnage involved.

Chicago—Structurals continue in strong demand. One producer is booked full for the fourth quarter and may have an order carryover into the first quarter of next year. However, inquiries from structural fabricators are lower now than they were a year ago, fabricators' backlogs reportedly being off about 10 per cent.

Pig Iron . . .

Pig Iron Prices, Page 208

Philadelphia—Possibility of freight absorption as a means of price shading in pig iron is talked of here as imports and the softening scrap market make themselves felt. Furnace inventories run about 60 days, and proximity of supply is a factor to encourage users. German iron is still coming in at \$52 and large buyers are asking suppliers to meet the competition.

Readjustment in castings prices is also a subject for speculation.

Alan Wood Steel Co. reduced pig iron prices \$2 per ton, effective Sept. 14, to \$58 furnace for basic, \$58.50 for No. 2 foundry, \$59 for malleable, and \$59.50 for bessemer. These are comparable to base prices at Bethlehem, Pa.

With a freight rate to Philadelphia of \$1.66 before the 3 per cent federal tax, against \$2.75 to Philadelphia from Bethlehem, Pa., Alan Wood for the first time in a long while has the price edge on domestic iron shipments into this city. In other words, the Swedeland producer is now quoting basic at \$59.66 delivered Philadelphia, No. 2 foundry \$60.16, malleable \$60.66 and bessemer \$61.16, as compared with \$60.75, \$61.25, \$61.75 and \$62.25, respectively, on shipments from Bethlehem.

Boston—Shipments are slightly higher this month with the melt unchanged except for a slight improvement at the smaller jobbing shops. Machine tool foundries are the most active and are melting nearer to capacity.

New York—Demand for pig iron is slack. Foundries are not melting to capacity in most cases and are reluctant to carry inventories over 30

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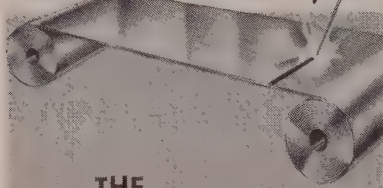
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days. To attain that goal some are not buying. There has been only slight improvement in demand for castings this month. Melt is below the second quarter level. Foreign iron is a more competitive factor, being offered freely from \$52 to \$55, f.o.b. dock.

While Alan Wood Steel Co. has reduced its pig iron prices \$2 per ton to \$58 furnace for basic, \$58.50 for No. 2 foundry, \$59 for malleable and \$59.50 for bessemer, the same base prices are prevailing at Bethlehem, Pa. and the Bethlehem producer still has the edge on delivered prices at Newark, N. J., and New York. Alan Wood's rate into Newark is \$3.5535 before 3 per cent federal tax, and into New York \$5.46.25, both higher than the rates from Bethlehem.

The smaller of the two furnaces at Swedeland, out since early August for relining, is back in operation.

Buffalo — Uncertainty prevails in the merchant pig iron market here. Auto manufacturers continue to call for substantial tonnage. However, there are signs of some leveling off.

Pittsburgh — Inventory reduction by area consumers continues. Some consumers still have reduced operations and are using more pig iron than they order. A return to normal market activity is now expected in mid-October.

Cleveland — The foundries are taking in pig iron steadily but the merchant market is not under the pressure it was some time back. In fact, pig iron salesmen are out pressing for tonnage as has not been the case in a long time.

District furnaces are operating at capacity and no piling of iron on yards is reported. However, a report in the trade here last week was to the effect an Ohio river producer was banking one blast furnace because of heavy yard stocks of iron.

Chicago — Slight seasonal improvement in foundry operations has given a little upturn in sales of merchant pig iron. However, foundry operations average only 60 to 65 per cent of their peak level. A notable depressant to foundry operations in this area is the drop in farm implement output. Also contributing to lethargy are cutbacks in automobile production.

Foundries are reducing inventories of pig iron and coke, some of the shops aiming to get their stocks down as low as a 10 to 12-day supply.

Iron Ore . . .

Iron Ore Prices, Page 227

Cleveland — Weekly movement of iron ore from the head of the lakes continues in heavy volume. Ship-

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ents in the week ended Sept. 14 scaled 3,147,481 gross tons, the Lake Superior Iron Ore Association reports. This compares with shipments of 3,388,057 tons in the preceding week and with 3,216,197 tons in the corresponding week of last year. Total shipments from the upper lakes in the shipping season to date now stand at 71,822,941 gross tons, only a little more than 28 million tons short of the 100 million ton 1953 season goal. Movement in the corresponding period of the 1952 shipping season was only 44,021,893 gross tons.

Scrap . . .

Scrap Prices, Page 230

New York—Brokers' buying prices continue to decline with business exceedingly dull, reflecting the disposition of consumers to further reduce their inventories. Actually there is so little trading that price changes are largely nominal.

Brokers' buying prices on No. 1 heavy melting and No. 1 bundles are nominally \$29 to \$30, on No. 2 heavy melting \$27 to \$27.50, on No. 2 bundles, \$24 to \$25, machine shop turnings, \$15.50 to \$16.50, and on low phosphos \$32 to \$33. Borings and short shovel turnings are nominally unchanged at \$19 to \$20 and \$20 to \$21 respectively. Prices on No. 1 cupola have dropped to \$31 to \$32 and on unstripped motor blocks to \$21 to \$22.

Cleveland—With trading at a virtual standstill the scrap market continues weak with prices off another \$1 to \$2 per ton. Current quotations are largely nominal in the absence of representative sales. Tonnage is moving to the mills on old contracts but no new buying is reported.

Meanwhile, while some stocks are accumulating in dealers' yards material is coming from manufacturing plants at a noticeably slower pace. Some market observers think the market is nearing bottom and that by next month prices will turn upward with resumption of mill buying, which, it is believed, will be necessary if consumers are to be protected over the winter.

Boston—Low steel scrap prices are not stimulating demand and new buying is slack. Ingot operations in this area are erratic, some mills producing near capacity one week and then falling off sharply the next.

Scrap inventories are substantial, notably No. 2 grades, and new buying is not up to current melt. No. 2 heavy melting and No. 2 bundles are slow and soft.

Buffalo—With three leading mill consumers out of the market scrap prices plunged up to \$3.50 per ton. Hardest blow to the market is the tieup of Bethlehem's Lackawanna



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plant by strike. The area's second largest buyer has extended an embargo on shipments.

Although no new business is reported in steelmaking grades dealers readily admit prices are off \$1 to \$2. A new sale was reported of cupola cast at \$33.50, a drop of \$3.50.

Philadelphia — The scrap market pulse can hardly be felt as prices continue their toboggan ride and buyers remain out of the market for as long as 60 days. The low could be hit by the end of this month. Mills have fairly decent inventories at present, but some observers think they could be buying too little to their sorrow.



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Pittsburgh — Prices continue to drop, with scrap moving very slowly. Some industry representatives feel that prices have nearly ended their skid. No. 1 heavy melting is quoted at \$40 to \$41 with No. 2 heavy melting also down \$1 to \$36 to \$37. Most cast iron grades and railroad scrap fell similarly.

Detroit — Quantity sales of scrap in this area are virtually at a standstill. Increases are not seen by observers in the near future with further decline in scrap prices indicated during the immediate period ahead. Prices quoted currently represent largely a "best guess" about a market which, for the moment, virtually does not exist.

Cincinnati — Local buying is at a standstill. All prices shown for the Cincinnati market are nominal, but are believed to be at a level which might encourage buying.

Youngstown — The scrap market continues in the doldrums here. Big consumers show little interest despite declining prices. Republic Steel Corp. and Sharon Steel Corp. are reported virtually out of the market, and Youngstown Sheet & Tube Co. is said to be buying only day-to-day requirements.

Scrap dealers are pessimistic. Prices are down to \$42 to \$43 for No. 1 heavy melting railroad scrap;

\$38 to \$40 for No. 1 heavy melting; \$37 to \$38 for No. 1 bundles; \$36 to \$37 for No. 2 heavy melting and \$32 to \$34 for No. 2 bundles. Turnings are especially depressed, with little market for them.

Chicago — New sales of steelmaking and blast furnace grades of scrap are lacking, and gradually declining rates of steel production are tending to add to consumer disinterest in buying. However, scrap is moving in fulfillment of old orders.

Because of the absence of new buying prices are largely nominal, with observers lowering their estimates of what new sales would bring. Low rate of operations in the foundry industry is keeping the cast grades in the doldrums.

St. Louis — Mill disinterest in stockpiling for winter continues to hamper the scrap trade. The industry is awaiting next week's developments with interest, when expiring orders may point up the coming trend. Prices softened moderately last week.

Birmingham — Scrap brokers and dealers report the market "at a standstill" with hardly enough buying, especially of melting steel, to form a conclusive price pattern.

Meanwhile, supplies are drying up as rural areas refuse to ship at current low price levels. Inability to get metal is reported to have shut down several scrap yards and baling presses in the district. Rail lists continue to get lighter, and roads are having trouble disposing of material at what they consider fair prices.

Los Angeles — With foundry activity depressed seasonally, demand for scrap is weaker.

San Francisco — Steel scrap prices in this area have finally weakened after holding steady for weeks in the face of price declines elsewhere in the country. New posted prices are down \$1 a ton across the entire range of steel scrap. Cast grades remain steady.

Seattle — The scrap market ranged from \$31 to \$33 for No. 1 heavy melting steel, \$27 to \$29 for No. 2. Oregon buyers are still paying top prices here but Bethlehem remains on the former price levels.

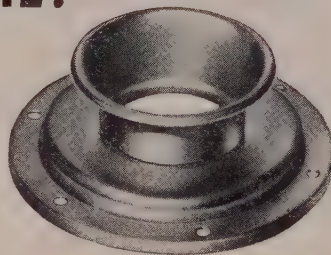
Ferroalloys . . .

Ferroalloy Prices, Page 224

Pittsburgh — U. S. Steel Corp. doubled ferromanganese production at its Duquesne Works last week converting No. 1 blast furnace from iron to ferro. No. 1 is Duquesne's second blast furnace to change to ferro production. This furnace produces 300 tons daily, added to the present 320-ton daily output of No. 2 furnace.

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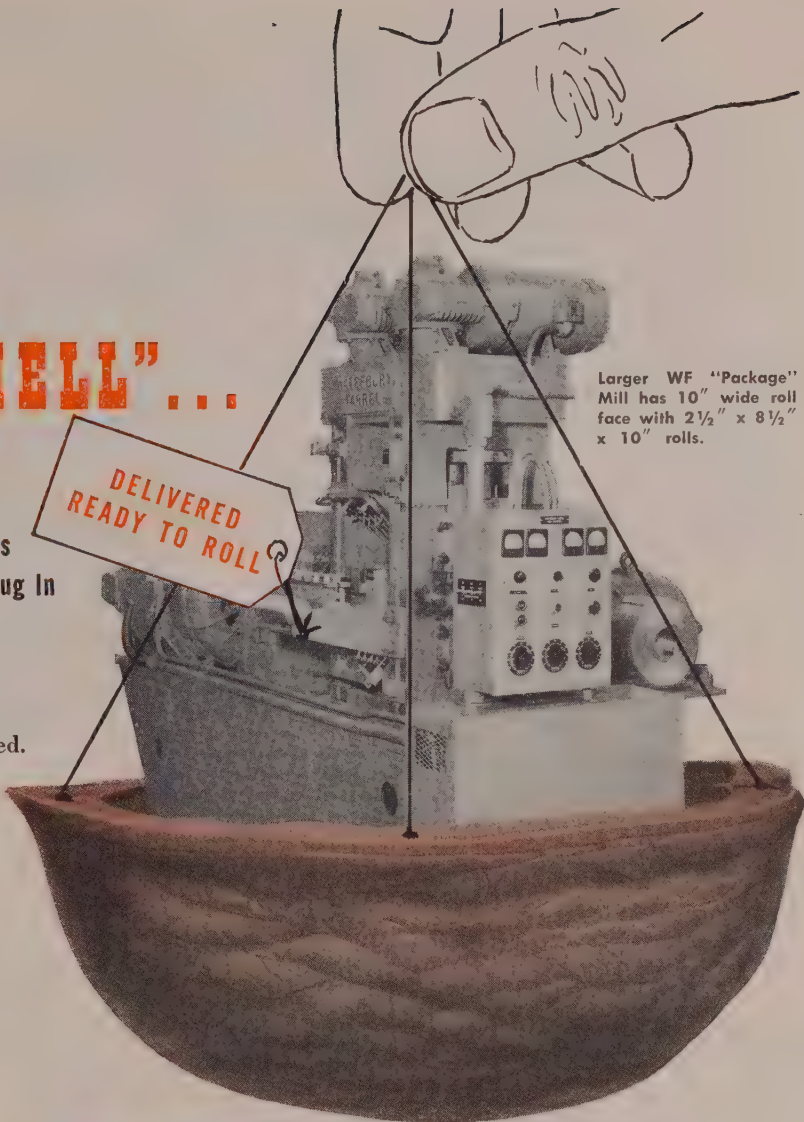
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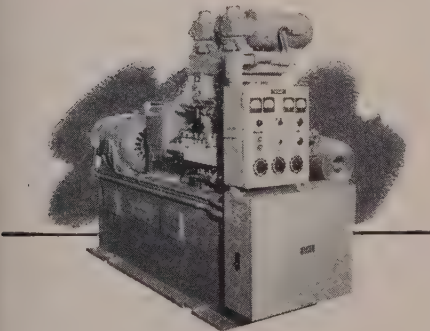
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Spiegelsteins: (19-21% Mn, 1-3% Si). Carlot per gross ton \$86, Palmerton, Pa.; \$87 Clairton and Duquesne, Pa.
(16 to 19% Mn) \$84 per ton, Palmerton, Pa.; \$85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton \$200, Clairton, Duquesne, Johnston and Sheridan, Pa.; add or subtract \$2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15¢ per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Ore.
(Mn 79-81%) Lump, \$208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add \$2.60 for each 1% above 81%; subtract \$2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 9.07¢ C, 27.95¢ per lb of contained Mn, carload packed 28.7¢, ton lots 28.8¢, less ton 31.0¢. Delivered. Deduct 0.5¢ for max. 0.15% C grade from above prices, 1¢ for max. 0.30% C, 1.5¢ for max. 0.50% C, and 4.5¢ for max. 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.08% max). Add 2.05¢ to the above prices. Spot, add 0.25¢.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35¢ per lb of contained Mn, carload packed 22.1¢, ton lot 23.2¢, less ton 24.4¢. Delivered. Spot, add 0.25¢.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2¢ per lb of metal; packed, 36.95¢; ton lot 35.45¢; less ton lots 40.45¢. Delivered. Spot, add 2¢.

Electromanganese: Carload, 31.5¢; ton lots 33.5¢; 250 to 1999 lb, 35.5¢. Premium for hydrogen-removed metal, 1.5¢ per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4¢ per lb of alloy, carload packed, 12.15¢, ton lots 13.05¢, less ton 14.05¢. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2¢ from above prices. For 3% C grade, Si 12-14.5%, deduct 0.6¢ from above prices. Spot, add 0.25¢.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, \$1.50 per lb of contained Ti; less ton \$1.55. (Ti 33-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots \$1.35, less ton \$1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5¢.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract \$177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract \$195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75¢ per lb of contained Cr; c.l., packed 25.65¢, ton lot 26.80¢, less ton 28.20¢. Delivered. Spot, add 0.25¢.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (simplex) 34.60¢ per lb contained Cr, 0.03% C 36.50¢, 0.04% C 35.50¢, 0.06% C 34.50¢, 0.10% C 34.00¢, 0.15% C 33.75¢, 0.20% C 33.50¢, 0.50% C 33.25¢, 1% C 33.00¢, 1.50% C 32.85¢, 2% C 32.75¢. Carload packed add 1.1¢, ton lot 2.2¢, less ton add 3.9¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. 8 M x D, bulk, 26.25¢ per lb contained Cr. Packed, c.l. 27.15¢, ton 28.50¢, less ton 30.25¢. Delivered. Spot, add 0.25¢.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35¢ per lb of alloy; ton lot 19.2¢; less ton lot, 20.4¢, delivered; spot, add 0.25¢.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75¢ per lb of contained chromium plus 12.4¢ per pound of contained silicon; 1" x down, bulk, 25.90¢ per pound of contained chromium plus 12.60¢ per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr. 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 25.75¢ per lb of contained chrome plus 12.4¢ per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload \$1.12, ton lots \$1.14, less ton \$1.16. Delivered. Spot, add 5¢. Prices on 0.10 per cent carbon grade, add 4¢ to above prices.

VANADIUM ALLOYS

Ferrovandium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, \$3.00 per lb of contained V. Delivered. Spot, add 10¢. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max) \$3.10. **Primos and High Speed Grades** (V 35-55%, 1.50% max, C 0.20% max) \$3.20.

Grainal: Vanadium Grainal No. 1, \$1 per lb; No. 6, 68¢; No. 79, 50¢, freight allowed.

Vanadium Oxide: Contract, less carload lots \$1.28 per lb contained V₂O₅, freight allowed. Spot, add 5¢.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0¢ per lb of contained Si, packed 21.40¢; ton lot 22.50¢, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40¢ per lb of contained Si, carload packed 14.0¢, ton lot 15.45¢, less ton 17.1¢. Delivered. Spot, add 0.45¢.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3¢ to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3¢ per lb of contained Si, carload packed 15.6¢, ton lot 16.75¢, less ton 18.0¢. Delivered. Spot, add 0.8¢.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0¢ per lb of contained Si, carload packed 18.2¢, ton lot 19.15¢, less ton 20.2¢. Delivered. Spot, add 0.25¢.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5¢ per lb of Si, c.l. packed 19.7¢, ton lot 20.6¢, less ton 21.6¢. Add 0.5¢ for max. 0.10% calcium grade. Deduct 0.5¢ for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25¢.

Alisfer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90¢ per lb of alloy, ton lots packed 11.30¢, 20 to 1999 lb 11.65¢, smaller lots 12.15¢.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump bulk 8.0¢ per lb of alloy, c.l. packed 8.75¢, ton lot 9.5¢, less ton 10.35¢. Delivered. Spot, add 0.25¢.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25¢ per lb of alloy, ton lot 21¢, less ton 22.25¢. Freight allowed. Spot add 0.25¢.

BORON ALLOYS

Ferroboreon: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max.). Contract, 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered, spot, add 5¢. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75¢ per pound; Grade B (14-18% B) \$1.20; Grade C (18% min B) \$1.50.

Borasil: (3 to 4% B, 40 to 45% Si), \$5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45¢ per lb; smaller lots, 50¢ per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50¢ per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0¢ per lb of alloy, carload packed 20.8¢, ton lot 22.3¢, less ton 23.3¢. Delivered. Spot add 0.25¢.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0¢ per lb of alloy, carload packed 20.2¢, ton lot 22.1¢, less ton 23.6¢. Del. Spot add 0.25¢.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25¢ per lb of briquet, carload packed 16.95¢, ton 17.75¢, less ton 18.65¢. Del. Add 0.25¢ for notching. Spot, add 0.25¢.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45¢ per lb or briquet, c.l. packaged 13.25¢, ton lot 14.05¢, less ton 14.95¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65¢, per lb of briquet, c.l. packaged 13.45¢, ton lot 14.25¢, less ton 15.15¢. Delivered. Add 0.25¢ for notching. Spot, add 0.25¢.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95¢ per lb of briquet. Packed c.l. 7.75¢, ton lot 8.85¢, less ton 9.45¢. Delivered. Spot, add 0.25¢.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1¢. Packed c.l. 7.9¢, ton lot 8.7¢, less ton 9.6¢. Delivered. Add 0.25¢ for notching, small size only. Spot, add 0.25¢.

Molybde-Oxide Briquets: (Containing 2½ lb of Mo each) \$1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 10,000 lb W or more, \$4.35 per lb of contained W; 2000 lb W to 10,000 lb W, \$4.45; less than 2000 lb W, \$4.57. f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D \$6.40 per lb of contained Cb, less ton \$6.45. Delivered. Spot, add 10¢.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, \$4.75 per lb of contained Cb plus Ta, del.; less ton lots \$4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45¢ per lb of alloy, ton lot 47¢, less ton 49¢. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7% Fe 20% approx). Contract, carload, packed ½" x 12 M, 17.5¢ per lb of alloy, ton lot 18.25¢, less ton 19.5¢. Del. Spot, add 0.25¢.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50¢ per lb of alloy; ton lots 18.50¢; less ton lots 20¢, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15¢ per lb of alloy ton lots 16.50¢; less ton lots 17.75¢, f.o.b. Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal Fe) Lump, carload, bulk 14.50¢. Packed c.l. 15.50, ton lots, 15.75¢, less ton lots, 16.25¢ per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% 1 content with unitage of \$3 for each 1% of 1 above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn. \$65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, \$1.32 in all size except powdered which is \$1.41; Washington, Pa., furnace, any quantity \$1.32.

Technical Molybde-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., \$1.14 in cans; in bags, \$1.13, f.o.b. Langeloth, Pa.; Washington, Pa., \$1.13.

**BETTER STAINLESS
CLOSER CONTROL
LOWER LABOR COSTS**
with ALLOYMET 2115



IN THE production of stainless steels, the trend is toward closer controls of analysis through the use of quality master alloy ingot. Our ALLOYMET 2115 ingot (70% Nickel—10% Chrome) is fast becoming the standard of the industry as a basic raw material in the production of stainless steels.

When ALLOYMET 2115 is used in the melt, the analysis of the finished product is never in doubt. Compare this with a heat of 18-8 scrap . . . but no, there is no comparison. Scrap—no matter how good it may be—is still an imperfect commodity that is generated; not made to order. ALLOYMET 2115, on the other hand, is a master alloy made to rigid specifications under the supervision of trained metallurgists who know the needs of the steel industry.

Steel producers are rapidly learning that to use master alloys in the place of scrap costs so very little more. Prove this by your own use.

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Alloy Metal Division

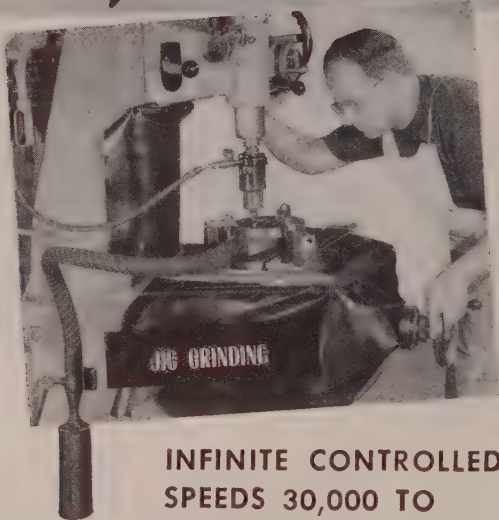
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JIG GRINDING ACCURACY *guaranteed**



**INFINITE CONTROLLED
SPEEDS 30,000 TO
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*Easily connect jig grinder
to jig borer or mill*

Then you can finish grind in hardened steel to "tenths" . . . jig grind dowel holes square with a ground base . . . move location of holes in hardened steel blocks . . . jig grind interchangeable holes in hardened sections . . . grind small holes with diamond impregnated mandrels . . . grind contours and relief with tungsten carbide burrs . . . grind radii in die sections . . . eliminate jig bushings in tools where close spacing is essential.

*Other infinitely controlled
air driven spindle applications*

Place spindle on most any machine. Use it for finishing contours on hardened steel working surfaces . . . burring or milling die castings . . . routing wood contours . . . carbide milling or finishing slots . . . finishing holes in hardened steel to "tenths" . . . grinding with diamond wheels, carbide burrs, or diamond impregnated mandrels.

Advantages—10 micro finishes using carbide mills . . . 6 micro finishes using mounted points, operates at any angle . . . air driven, air cooled, overheating prevented . . . speed controlled at optimum point . . . 3 1/4" long motor uses little working space . . . By controlling speed at any point you abolish need for many constant speed spindles.

For immediate quotation please state machine tool application. Get this manual of photos showing operations Vulcanaire performs.

**Dependably accurate to "tenths"*



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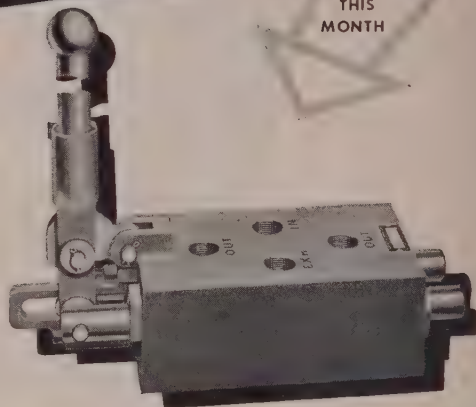
VULCAN TOOL CO.,

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Quick-As-Wink AIR AND HYDRAULIC Control Valves

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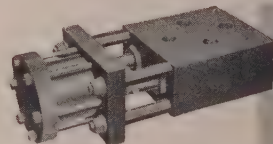


Lever Operated Hydraulic Valves

For line pressures up to 5000 psi

● Unsurpassed for efficient trouble-free service controlling single or double acting hydraulic cylinders and other important high pressure hydraulic circuits. Positive, fast acting. All parts are in pressure balance, eliminating any tendency to creep or crawl. Machined steel housings, with chrome plated and polished stainless steel plungers. Self sealing U-packers. Metal valving rings take the impingement of the liquid, minimizing wear on the packings. 1/2" to 1 1/2" sizes. Also available in pilot operated designs; sizes to 4". Write for details.

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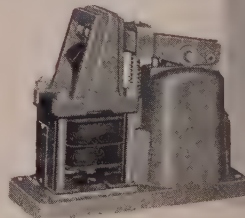


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Two position valves 1 1/2" to 4" sizes for line pressures from 1000 to 5000 psi. Valve is placed close to the work and operated from a central control point with an easy to handle air valve avoiding operator fatigue.

SOLENOID OPERATED AIR VALVES

Widely used for controlling single and double acting air cylinders, clutch and brake controls, etc. Solenoid is directly connected to valve operating mechanisms. 3/8" to 1 1/2" sizes. 2-way, 3-way and 4-way actions.



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1913 EAST PERSHING STREET

SALEM, OHIO



ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, over lake ports.)

Old range bessemer	\$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-heat lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.
 Foundry and basic 56-62% concentrates contract 17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports
 Swedish basic, 60 to 68%: Spot nom.
 Long-term contract 22.00
 North African hematites (spot) 24.00-26.00
 Brazilian iron ore, 68-69% (spot) 25.00

Tungsten Ore

Net ton unit, duty paid
 Foreign wolframite and scheelite, per net ton unit \$55.00
 Domestic scheelite, mine 63.00

Manganese Ore

Manganese, 48% nearby, \$1.15-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90-98c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1 \$40.00-\$42.00
 48% 3:1 44.00-46.00
 48% no ratio 32.00-34.00

South African Transvaal

44% no ratio \$27.00-28.00
 48% no ratio 34.00-35.00

Brazilian

44% 2.5:1 lump nom. \$32

Domestic

(Rail nearest seller)
 48% 3:1 \$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines \$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., \$89.00; Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Loch Haven, Lumber, Orvison, West Decatur, Pa., Bessemer, Ala., Farbo, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., \$109.00; Salina, Pa., \$114.00; Niles, O., \$120; Los Angeles, Pittsburgh, Calif., \$132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., \$115.00; Hays, Pa., \$120.00; Niles, O., \$123; E. Chicago, Ind., Joliet, Rockdale, Ill., \$125.00; Cutler, Utah, \$116.55; Los Angeles, \$122.85.

Insulating Fire Brick

2300° F: Massillon, O., \$178.50; Clearfield, Pa., \$197.50; Augusta, Ga., Beaver Falls, Zelenople, Pa., Mexico, Mo., \$186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., \$64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wells-ville, O., \$77.50; Mexico, Mo., \$73.50; Clearfield, Pa., Portsmouth, O., \$83; Perla, Ark., \$109.00; Los Angeles, \$110.25; Pittsburgh, Calif., \$111.30.

Sleeves

Reesdale, Pa., \$139.70; Johnstown, Pa., \$140.00; Clearfield, Pa., \$148.50; St. Louis, \$151.80; Athens, Tex., \$155.00.

Nozzles

Reesdale, Pa., \$223.50; Johnstown, Pa., \$229.20; Clearfield, Pa., \$241.40; St. Louis, \$247.10; Athens, Tex., \$247.70.

Runners

Reesdale, Pa., \$174.00; Johnstown, Pa., \$177.50; Clearfield, Pa., \$185.50; St. Louis, \$187.30; Athens, Tex., \$191.80.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., \$179.00; Danville, Ill., \$169.30.
 60 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$223.00; Danville, Ill., \$213.20.
 70 Per Cent: St. Louis, Mexico, Vandalia, Mo., \$255.00; Danville, Ill., \$258.00; Clearfield, Pa., \$252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Millersville, Martin, Gibsonburg, Woodville, O., \$13.75; Thornton, McCook, Ill., \$13.85; Dolly Siding, Bonne Terre, Mo., \$13.65; Nario and Bettsville, O., \$14.50.

Magnesite

Domestic, deadburned bulk; Luning, Nev., \$38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace \$14.50-15.00
 Connellsville, foundry 16.50-17.00
 New River foundry 20.80
 Wise county foundry 15.95
 Wise county, furnace 15.20

Oven Foundry Coke

Kearney, N. J. ovens \$24.00
 Everett, Mass., ovens
 New England, del. \$26.00
 Chicago ovens 24.50
 Chicago, del. 26.00
 Terre Haute, ovens 24.05
 Milwaukee, ovens 25.25
 Indianapolis, ovens 24.25
 Chicago, del. 28.12
 Cincinnati, del. 25.85
 Painesville, O., ovens 25.50
 Cleveland, del. 27.43
 Erie, Pa., ovens 25.00
 Birmingham, ovens 21.65
 Cincinnati, del. 26.58
 Lone Star, Tex., ovens 18.50
 Philadelphia, ovens 23.95
 Swedeland, Pa., ovens 23.85
 St. Louis, ovens
 St. Louis, del. 26.00
 St. Paul, ovens 23.75
 Portsmouth, O., ovens 24.00
 Cincinnati, del. 26.62
 Detroit, ovens 25.50
 Detroit, del. 26.50
 Buffalo, del. 28.08
 Flint, del. 28.23
 Pontiac, del. 27.06
 Saginaw, del. 28.53

*Or within \$4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 36.00
 Toluol, one deg. 30.00-33.00
 Industrial xylol 30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia \$44-45
 Birmingham area \$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums) 17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content 72.5%, \$44; 70%, \$42.50; 60%, \$38. Imported, net ton, duty paid, metallurgical grade, \$35-\$36.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam.	Inches	Length	Cents per lb
17, 18, 20		60, 72	17.85
8 to 16		48, 60, 72	17.85
7		48, 60	19.57
6		48, 60	20.95

CARBON

35, 40	110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
17 to 20	34, 90	8.03

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and Dependability
Standards with WW!



WW

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Seam welding wheels of any size are available in Weiger-Weed alloys. To facilitate delivery, Weiger-Weed normally maintains a basic stock of many sizes of wheel blanks in finished form, or in rough form for user to finish machining. Generally, users find it more advantageous to order wheels completely finished.

We try to make wheel blanks available from stock for finishing to the following sizes:

Diameter: 7" 8" 8" 10" 10" 10"
 Thickness: 3/8" 3/8" 1/2" 3/8" 1/2" 3/4"

Other sizes available on request.

WHEELS ARE SUPPLIED IN WW-1, WW-2 AND WW-3 ALLOYS—(R.W.M.A. CLASSES 1, 2 AND 3)

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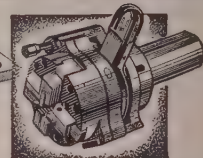
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Whitehall, Palm Beach, Fla.
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Fasteners . . .

Bolt, Nut, Rivet Prices, Page 207

Cleveland — Industrial fastener makers report demand holding up surprisingly well, some noting an improvement in buying since the end of the vacation season. In general, however, pressure is not what it was some time back, this partly being attributed to increasing tendency of consumers to order more cautiously with supply improved and the business outlook uncertain.

Much the same market situation prevails with respect to wrought washers as with bolts, nuts, rivets, screws, etc. Demand is reported at a satisfactorily high level with consumers tending to be more cautious in forward buying.

Rails, Cars . . .

Track Material Prices, Page 207

San Francisco — Southern Pacific Co. has ordered an additional 1250 box cars, lifting the number of freight cars placed in service or still on order since the end of World War II. About 3500 freight cars remain to be delivered on previous orders. The newest lot of freight cars of 50-foot length will be built in Southern Pacific's shops in Sacramento, Calif.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

585 tons, bridge, Wyoming county, Pa., LR 479 (Sec. 7); Reed & Kuhn, general contractors, to Pine Brook Iron Works, Wilkes-Barre, Pa.
535 tons, two state bridges, New Castle-Portsmouth, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; Landers & Griffin, Inc., Portsmouth, general contractor; also 225 tons, steel bearing piles.
500 tons or more, slide gates, etc., Lucky Peak dam, to Pacific Coast Engineering Co., Alameda, Calif., by U. S. Engineer, Walla Walla, Wash.; bids opened July 23.

STRUCTURAL STEEL PENDING

6300 tons, rebids on car repair shop, Hollidaysburg, Pa., Pennsylvania railroad; design revised requiring extra tonnage; due Sept. 29.
6000 tons, office building, 300 Park Ave., New York; pending.
3500 tons, hospital, Newark, N. J.; re-advertised.
3000 tons, hospital, Welfare Island, New York; pending.
3000 tons, bridge superstructure, Westfield river, West Springfield, Mass.; bids postponed to Sept. 29.
1500 tons, alert hangars, Westover Field, Chicopee, Mass.; bids to U. S. Engineer, Boston.
600 tons, Army depot warehouse, Ft. Richardson, Alaska; Schmid & Lewis, Seattle, low \$1,350,767, to U. S. Engineer, Seattle.
435 tons, bridge approaches, Agawam, Mass.; Henley-Lundgren Co., Shrewsbury, Mass., low.
330 tons, also 55 tons reinforcing, Washington state bridge, Watcom county; A. V. Phillips, Seattle, low \$399,043.
300 tons, state highway bridge, Bedford, Mass.; bids Sept. 22, Boston.
275 tons, state highway bridge, over D. L. & W. railroad, Newark, N. J.; bids Sept. 29, Trenton.
230 tons, building, General Electric Supply Co., Philadelphia, due Sept. 15.

(Please Turn to Page 232)



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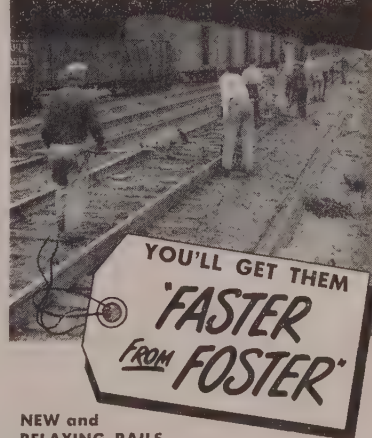
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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP
COMPOSITE

Sept. 17	\$37.50
Sept. 10	38.67
Aug. avg.	43.40
Sept. 1952	43.00
Sept. 1948	43.33

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	40.00-41.00
No. 2 heavy melting...	36.00-37.00
No. 1 bundles	40.00-41.00
No. 2 bundles	34.00-35.00
No. 1 busheling	40.00-41.00
Machine shop turnings...	25.00-26.00
Mixed borings, turnings...	27.00-28.00
Short shovel turnings...	29.00-30.00
Cast iron borings	28.00-29.00
Cut structurals	45.00-46.00
Heavy turnings	37.00-38.00
Punchings & plate scrap	45.00-46.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Charging box cast	39.00-40.00
Heavy breakable cast	37.00-38.00
Unstripped motor block	34.00-35.00
No. 1 machinery cast	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt..	42.00-43.00
Rails, 2-ft. and under	28.00-29.00
Rails, 18-in. and under	27.00-28.00
Rails, random lengths	47.00-48.00
Railroad specialties	46.50-47.50

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting...	33.00-34.00
No. 2 heavy melting...	30.00-31.00
No. 1 bundles	33.00-34.00
No. 2 bundles	28.00-29.00
No. 1 busheling	33.00-34.00
Machine shop turnings...	19.00-20.00
Mixed borings, turnings...	23.00-24.00
Short shovel turnings...	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	38.00-39.00
Alloy free, short shovel turnings	27.00-28.00
Electric furnace bundles	35.00-36.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	39.00-40.00
Stove plate	40.00-41.00
Heavy breakable cast	35.00-36.00
Unstripped motor blocks	25.00-26.00
Brake shoes	35.00-36.00
Clean auto cast	42.00-43.00
No. 1 wheels	37.00-38.00
Burnt cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt..	40.00-41.00
R.R. Malleable	45.00-46.00
Rails, 3-ft. and under	51.00-52.00
Rails, 18 in. and under	42.00-43.00
Rails, random lengths	44.00-45.00
Cast steel	43.00-44.00
Railroad, specialties	46.00-47.00
Uncut tires	45.00-46.00
Angles, splice bars	46.00-47.00
Rails, rerolling	49.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting...	36.00-37.00
No. 2 heavy melting...	34.00-35.00
No. 1 bundles	36.00-37.00
No. 2 bundles	30.00-31.00
Machine shop turnings...	20.00-21.00

Short shovel turnings...	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	43.00-44.00
Electric furnace bundles	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt..	40.00-41.00
-------------------------	-------------

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	36.00-37.00
No. 2 heavy melting...	32.50-33.50
No. 1 bundles	36.00-37.00
No. 2 bundles	31.00-32.00
No. 1 busheling	36.00-37.00
Electric furnace bundles	38.00-39.00
Machine shop turnings...	23.00-24.00
Mixed borings, turnings...	26.00-27.00
Short shovel turnings...	27.00-28.00
Structurals & plate	41.00-42.00
Heavy turnings	36.00-37.00
Couplers, spring, wheels	44.00-45.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	nom.
Heavy breakable cast	38.00
Unstripped motor blocks	29.00-30.00
Drop broken machinery	44.00-44.50

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	29.00-30.00
No. 2 heavy melting...	27.00-27.50
No. 1 bundles	29.00-30.00
No. 2 bundles	24.00-25.00
Machine shop turnings...	15.50-16.50
Mixed, borings, short turnings	19.00-20.00
Low phos. (structural & plate)	32.00-33.00
Short shovel turnings	20.00-21.00

Cast Iron Grades

No. 1 cupola	31.00-32.00
Unstripped motor blocks	21.00-22.00

DETROIT

No. 1 heavy melting...	34.00-35.00
No. 2 heavy melting...	26.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00
No. 1 busheling	33.00-34.00
Machine shop turnings...	15.00
Mixed borings, turnings...	15.00
Short shovel turnings	17.00
Punchings & plate scrap	37.00-38.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	34.00-35.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	44.00

CINCINNATI

(Brokers' buying prices)

No. 1 heavy melting...	35.00-36.00
No. 2 heavy melting...	32.00-33.00
No. 1 bundles	35.00-36.00
No. 2 bundles	29.00-30.00
No. 1 busheling	35.00-36.00
Machine shop turnings...	16.00*
Mixed borings, turnings...	19.00*
Short shovel turnings...	20.00*
Cast iron borings	19.00*

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	37.00
Heavy breakable cast	36.00
Drop broken machinery	47.00

Railroad Scrap

No. 1 R.R., heavy melt..	39.00
Malleable	47.00
Rails, 18-in. and under	52.00
Rails, random lengths..	46.00

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting...	35.00-36.00
No. 2 heavy melting...	30.00-32.00
No. 1 factory bundles...	34.00-35.00
No. 1 dealer bundles...	34.00-35.00
No. 2 bundles	29.00-30.00
No. 1 busheling	34.00-35.00
Machine shop turnings...	15.00-17.00
Mixed borings, turnings...	16.00-18.00
Short shovel turnings...	16.00-18.00
Cast iron borings	16.00-18.00
Cut structurals, 3-ft.	37.00-38.00
Punchings & plate scrap	41.00-43.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	34.00-36.00
Stove plate	32.00-34.00
Unstripped motor blocks	31.00-33.00
Clean auto cast	41.00-43.00
Drop broken machinery	40.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt	37.00-38.00
R.R. Malleable	40.00-42.00
Rails, 2-ft. and under	46.00-48.00
Rails, 18-in. and under	47.00-49.00
Angles, splice bars	44.00-46.00
Rails, rerolling	51.00-53.00

BIRMINGHAM

No. 1 heavy melting...	26.00-26.50
No. 2 heavy melting...	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings...	19.50-20.50
Short shovel turnings	21.50-22.50
Cast iron borings	17.00-17.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	45.00-46.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting...	34.00-35.00
No. 2 heavy melting...	29.00-31.00
No. 1 bundles	32.00-33.00
No. 2 bundles	25.00-26.00
Machine shop turnings...	15.00-16.00
Short shovel turnings...	17.00-18.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	29.00-30.00
Heavy breakable cast	29.00-30.00
Unstripped motor blocks	29.00-30.00
Brake shoes	38.00-39.00
Clean auto cast	38.00-40.00
Burnt cast	29.00-30.00

Railroad Scrap

Malleable	42.00-43.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	40.00-42.00
Uncut tires	41.00-42.00
Angles, splice bars	42.00-43.00
Rails, rerolling	42.00-43.00

BUFFALO

No. 1 heavy melting...	39.00-40.00
No. 2 heavy melting...	35.00-35.50
No. 1 bundles	39.00-40.00
No. 2 bundles	33.00-33.50
No. 1 busheling	39.00-40.00
Machine shop turnings...	21.00-21.50
Mixed borings, turnings...	26.00-26.50
Short shovel turnings...	27.00-27.50
Cast iron borings	26.00-26.50
Low phos.	45.00-46.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	33.50
No. 1 machinery	37.50-38.00

Railroad Scrap

Rails, random lengths...	41.00-42.00
Rails, 2 ft and under	47.00-48.00
Railroad specialties	47.00-47.50

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	28.00-29.00
No. 2 heavy melting...	24.00-24.50
No. 1 bundles	28.00-29.00
No. 2 bundles	22.00-22.50
Machine shop turnings...	13.00
Mixed borings, turnings...	17.50-18.00
Short shovel turnings...	15.50-16.00
No. 1 cast	30.00-31.00
Mixed cupola cast	26.00-28.00
No. 1 machinery cast	35.00-39.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting...	31.00-33.00
No. 2 heavy melting...	29.00-31.00
No. 1 bundles	28.00
No. 2 bundles	23.00
No. 3 bundles	19.00
Machine shop turnings...	14.00
Mixed borings, turnings...	14.00
Short shovel turnings...	14.00
Electric furnace, No. 1	38.00-40.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths.	34.00-35.00
------------------------	-------------

SAN FRANCISCO

No. 1 heavy melting...	27.00
No. 2 heavy melting...	23.00
No. 1 bundles	24.00
No. 2 bundles	21.00
No. 1 busheling	27.00
Machine shop turnings...	9.00
Mixed borings, turnings...	9.00
Short shovel turnings...	13.00
Cast iron borings	13.00
Cut structurals	32.40
Heavy turnings	13.00
Punchings & plate scrap	33.00
Electric furnace bundles	24.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	23.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting...	24.00
No. 2 heavy melting...	20.00
No. 1 bundles	23.00
No. 2 bundles	20.00
Machine shop turnings...	8.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	37.00-40.00
--------------------	-------------

HAMILTON, ONT.

(Delivered prices)

Heavy melting	\$32.5
No. 1 bundles	32.5
No. 2 bundles	32.5
Mechanical bundles	28.5
Mixed steel scrap	28.5
Mixed borings, turnings...	28.5
Rails, remelting	32.5
Rails, rerolling	41.5
Busheling	26.5
Busheling new factory:	
Prep'd	30.5
Unprep'd	28.5
Short steel turnings	22.5

Cast Iron Grades

No. 1 machinery cast ..	46.00-50.00
-------------------------	-------------

†F.o.b., shipping point.

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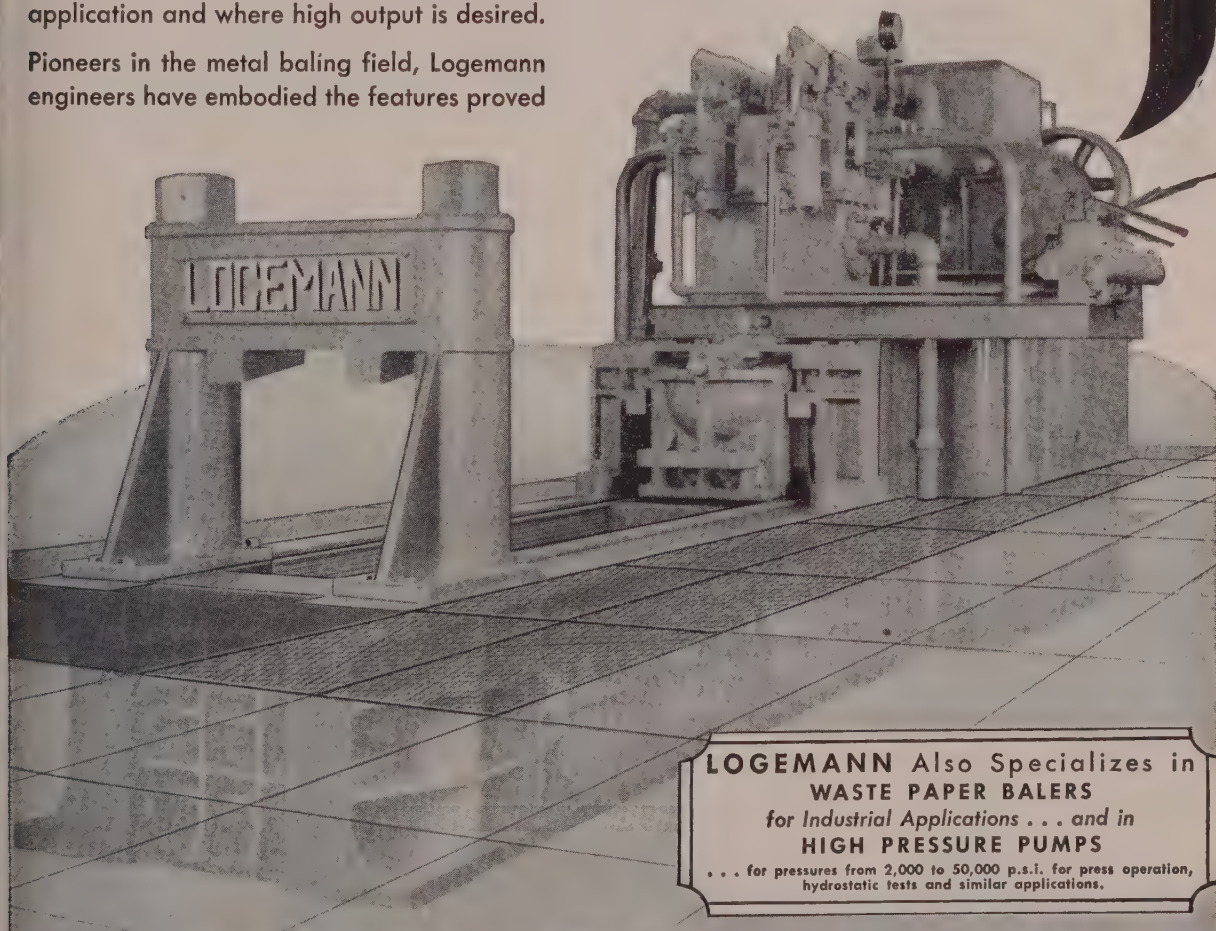
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REINFORCING BARS . . .

REINFORCING BARS PLACED

1100 tons, Chandler pumping project, Columbia Basin project, to Bethlehem Pacific Coast Steel Co., Seattle; A. J. Cheff Construction Co., Seattle, general contractor.

REINFORCING BARS PENDING

550 tons, Garden City state parkway, contract 57, section 2, Passaic county, N. J., bids Sept. 21.
470 tons, Garden City state parkway, contract 22, section 2, Essex county, N. J., bids Sept. 28.
225 tons, Washington state highway span, Snohomish county; general contract to Barrow & Shaffer, Everett, Wash., low \$242,903.
220 tons, Washington state overcrossing, Thurston county; Lockyear & White, Longview, Wash., low \$237,233.
100 tons, Bureau of Roads bridge, Charles National Forest, Idaho; bids to Boise, Idaho, Sept. 18.
Unstated, two Montana state highway bridges, Hill, Lewis and Clark counties; bids to Helena, Mont., Sept. 16.
Unstated, Army depot, Ft. Richardson, Alaska; bids in at Seattle.
Unstated, telephone building, Helena, Mont.; bids in.

PLATES . . .

PLATES PENDING

Unstated, also shapes, bulk petroleum storage tanks, Hanford Works; Sound Construction & Engineering Co., Seattle, low \$1,278,887.

PIPE . . .

CAST IRON PIPE PENDING

Unstated, 20,000 feet 10 to 6-in., also gates and hydrants, for Anchorage, Alaska; bids to Public Works Division, Juneau, Alaska, Sept. 30.
Unstated, 17,000 feet, 8, 6 and 4-in., water mains and accessories; also 150,000-gal. steel reservoir; bids to Forks, Wash., Sept. 24.

RAILS, CARS . . .

RAILROAD CARS PLACED

Canadian Pacific, four rail-diesel cars, to the Budd Co., Philadelphia.
Continental Blacks Inc., Amarillo, Tex., 15 covered hopper cars to the Thrall Car Mfg. Co.
Illinois Central, 100 seventy-ton, round hatch hoppers, to American Car & Foundry Co., Huntington, W. Va.
Southern Pacific, 1250 box cars, to own shops, Sacramento, Calif.

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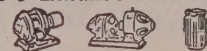
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